Questions 2 on lesson One



• Remember • Understand • Apply & Higher skills

School book questions.

1. Choose the correct answer:

۰	and children contracts	dillotter i		
	1. The number of known	n elements up till nov	v is elements	
	a. 92	b. 118	c. 121	d. 211
	2. All of these elements	are metal solid eleme	ents, except	
	a. sodium.	b. magnesium.	c. mercury.	d. aluminium.
	3. All of the following a	re properties of meta	ls, except	
	a. they are malleable	and ductile.		
	b. they are good cond	luctors of electricity.		
	c. they contain 1, 2 or	r 3 electrons in outer	most shell.	
	d. they are bad condu	ctors of heat.		
8	4. All of the following a	re metals, except		
	a. iron.	b. oxygen.	c. copper.	d. sodium.
	5. Oxygen is from			
	a. acids.	b. bases.	c. metal elements.	d. nonmetal elements.
	6. The element which ha	as atomic number 12	is considered from	
	a. metals.	b. nonmetals.	c. noble gases.	d. no correct answer.
	7. When an atom of an e	element loses one ele	ctron or more, it char	
	a. a negative ion.	b. a positive ion.	c. a neutral atom.	d. no correct answer.
	8. All of the following e	lements can form por	sitive ions, except	
	a. sodium (11Na).		b. chlorine (17Cl).	
	c. magnesium (₁₂ Mg)		d. aluminium (₁₃ Al)	
1	9. Which of the following	ng figures represents	the structure of sodiu	ım ion ? Fig. (······).
	K L (+10))	K L M (+11)))) b. 2 8 1	K L (+12)) c. 2 8	d. 2 8
1				c 11- ! !

- 10. The number of energy levels in sodium ion is the number of energy levels in its atom.
 - a. less than
- b. more than
- c. equal to
- d. no correct answer



í	11.	when an atom is ch	anged into an ion, the	e is changed.	
		a. number of proton	s	b. number of neutro	ons
		c. number of electro	ons	d. mass number	
	12.	A lithium atom (Li)	changes into a lithiu	m ion (Li+), which m	eans that it
		a. gains one proton.		b. gains one electro	n.
		c. loses one proton.		d. loses one electro	n.
	13.	During the chemical changes into		sium atom (₁₂ Mg) lo	oses its outer electrons and
		a. Mg ⁺	b. Mg ⁻	c. Mg ⁺²	d. Mg ⁻²
	14.	The only nonmetal the	hat exists in a liquid	state is	
		a. bromine.	b. chlorine.	c. hydrogen.	d. nitrogen.
	15.	All of nonmetals do	n't conduct electrici	ty, except	
		a. bromine.	b. aluminium.	c. graphite.	d. mercury.
	16.	In a negative ion, th	e number of protons	is the number	er of electrons.
		a. less than	b. more than		d. no correct answer
	17.	All of these element	ts can form negative	ions, except	
					d. aluminium (₁₃ Al).
	18.				er shell, it becomes
		a. N ⁺³	b. N ⁻²	c. N ⁻³	d. N-
	19.	The number of elect	rons in oxygen ion (O ⁻²) is electr	ons.
		a. 6	b. 8	c. 10	d. 12
	20.	Which of the follows	ing figures represent	s the chloride ion (Cl	(-) ? Fig. (······).
		a. 2 8	b. 2 8 7	K L M (+17))))	K L (+17)) d. 2 7
	21.	The number of	determines the ty	pe of element and its	chemical activity.
				b. levels filled with	
		c. neutrons		d. protons	
	22.	All the following are	e properties of inert	gases, except	
		a. they don't particip	pate in chemical read	ctions.	
		b. their outermost el		npletely filled.	
		c. they form negativ			
		d. their molecules co	onsist of one single a	itom.	

	23.	All of these elemen	ts can participate in c	themical reactions, ex	xcept
		a. sodium (₁₁ Na).	b. neon (₁₀ Ne).	c. hydrogen (₁ H).	d. nitrogen (7N).
,	24.	The molecule of a n	oble gas consists of		
		a. two different ator	ns.	b. one atom.	
		c. two similar atoms	5.	d. one or two simila	ar atoms.
,	25.	During the formation	on of a sodium chloric	de molecule, sodium	atom
		a. gains one electron	n from chlorine atom		
		b. gives one electron	n to chlorine atom.		
		c. gains two electron	ns from chlorine aton	n.	
		d. gives two electron	ns to chlorine atom.		
,	26.	During the formation	of a magnesium oxid	le molecule, oxygen a	tom changes into
		a. positive ion and c	arries one positive ch	narge.	
		b. negative ion and	carries one negative of	charge.	
		c. positive ion and c	earries two positive cl	harges.	
		d. negative ion and	carries two negative	charges.	
,	27.	The bond in a sodiu	m chloride molecule	is bond.	
		a. single covalent	b. double covalent	c. triple covalent	d. ionic
,	28.	The covalent bond u	sually arises between	ı elements.	
		a. two metallic		b. two nonmetallic	
		c. metallic and nonr	metallic	d. metallic and nobl	e
,	29.	All of the following	are examples of sing	gle covalent bonds, e	xcept
		a. H ₂	b. HCl	c. N ₂	d. H ₂ O
	30.	Which of the follow	ring figures represent	s the molecule of wa	ter ? Fig.().
			H		
		H	(0)(0)	H	(H)
		a.	b.	с.	d.
	21		are covalent molecu		
ĺ	31.	a. H_2O	b. MgO	c. HCl	d. O ₂
	22	-	Control of the contro		2
	32.		in an oxygen molecul b. double	c. triple	d. no correct answer
	-	a. single			
	33.		valent bond in	c. oxygen	d. nitrogen
		a. hydrogen	b. chlorine	C. Oxygen	u. muogon



	2. Put () or () in front of the following statements and correct the w	ron	ıq
	ones:		3
	1. All metals are solids except mercury which is a liquid.	()
	2. Metals tend to lose electrons and convert into negative ions.	()
	3. Sodium, magnesium and aluminium can form positive ions.	()
	4. In a positive ion, the number of electrons is greater than the number of protons.	()
	5. Nonmetals have more than four electrons in their outer shells.	()
	6. Metals are malleable and ductile, while nonmetals are not.	()
	7. The outermost energy level of sodium ion (Na ⁺) has one electron.	()
ú	8. Graphite is the only nonmetal that conducts electricity.	()
9	9. The molecules of noble gases are diatomic molecules.	()
	10. Ionic bond arises between two nonmetals.	()
	11. The bond in sodium chloride is a single covalent bond.	()
- 1	• 12. During the formation of a magnesium oxide molecule, a magnesium atom gains	,	
	two electrons from oxygen atom.	()
	13. Magnesium oxide is an ionic compound.	()
	14. In an ionic bond, the metal atom gives electrons to the nonmetal atom.	()
3	15. The bond in a hydrogen molecule is a double covalent bond.	()
- 1	16. Each atom in an oxygen molecule shares by two electrons.	()
	17. The bond in a nitrogen molecule is a triple covalent bond.	()
•	18. In a covalent bond, the two nonmetal atoms do not lose or gain electrons.	()
1	19. The bond in water molecule is an ionic bond.	()
	Write the scientific term of each of the following:		1(5)
•	1. Elements have luster, good conductors of heat and electricity and they contain than (4) electrons in their outer electron shells.	ı le	SS
•	2. The only metal that exists in a liquid state.		
•	3. Elements that may be solids, liquids or gases and having no luster, bad conductor heat and electricity and containing more than (4) electrons in their outer electron she	ors (of
1	4. The only nonmetal that exists in a liquid state.	шs.	
•	5. The only nonmetal that conducts electricity.		
	6. An atom that has lost an electron or more during the chemical reaction.		
	7. An atom gained one electron or more during the chemical reaction.		
	8. An atom of an element that gives or gains an electron or more during the chemical reaction	on	
•	9. An atom of an element that neither loses nor gains any electrons.	<i>/</i> 11.	
-	10. Elements whose outermost shells are completely filled with electrons.		

- 11. A bond resulting from the electric attraction between a positive ion and a negative ion.
- 12. The bond that is formed between magnesium and oxygen atoms.
 - The chemical bond originated between two elements have atomic numbers 11 and 17.
- 13. A bond that is formed between two nonmetals with sharing of electrons.
- 14. A bond arises between two hydrogen atoms, where each atom shares with one electron.
- 15. A bond that is resulted from the sharing of each atom with two electrons.
- 16. A bond that is formed between two nonmetals through sharing of each atom by three electrons.
 - A bond resulting from the participation of each of the two atoms with three electrons.

4. Complete the following statements:

- 1. The number of known elements up till now is elements.
- 2. Elements are classified according to their properties and electronic structure into, and
- 3. Metals have less than electrons in their outermost shell.
- 4. All metals are except which is a liquid.
- 5. elements are good conductors of heat and electricity.
- 6. Atoms of tend to lose an electron or more during the chemical reaction and change into ions.
- 7. and atoms are examples of metal atoms.
- 8. During the chemical reaction, a sodium atom (23Na) one electron and changes into ion.
- 9. The number of electrons in the outermost shell of a magnesium (²⁴₁₂Mg) atom is, while that of a magnesium ion is
- 10. Nonmetals have than 4 electrons in their outermost shell.
- 11. Some nonmetals are gases as and others are solids as
- 12. All nonmetals are conductors of electricity except which is

 conductor of electricity.
- 13. Elements of have luster, while elements of do not have luster.
- 14. Elements of are malleable and ductile, while elements of are not malleable or ductile.
- 15. is the only liquid metallic element, while is the only liquid nonmetallic element.
 - 16. A nitrogen atom contains electrons, while a nitrogen ion contains electrons.
 - 17. The symbol of an oxygen ion is, while that of a sodium ion is
 - 18. The number of energy levels in an atom of element is equal to the number of energy levels in its ion, while the number of energy levels in an atom of element is more than the number of energy levels in its ion.
- 19. An atom of doesn't lose or gain any electrons under ordinary conditions.



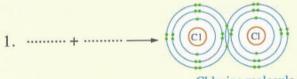
- 20. elements do not participate in chemical reactions in ordinary conditions as the outer shell is filled with
- 21. An ionic bond arises between and elements.
- 22. An ionic bond resulted from the electric attraction between and
- 23. During the formation of sodium chloride, (17Cl) atom one electron and changes into ion.
- 24. During the formation of (MgO) molecule, atom loses electrons which are gained by atom.
- 25. and are examples of ionic compounds.
- 26. Covalent bonds are formed between two elements.
- 27. In bond, the atoms don't lose or gain any electrons.
- 28. The chemical bond in a magnesium oxide molecule is bond, while the bond in oxygen molecule is bond.
- 29. The bond in sodium chloride molecule is bond, whereas the bonds in water molecule are bonds.
- 30. An oxygen atom two electrons during the formation of a magnesium oxide molecule, while it two electrons during the formation of an oxygen molecule.
- 31. The types of covalent bonds are, and
- 32. The bond in a hydrogen molecule is a bond, while the bond in a nitrogen molecule is a bond.

. Complete the following tables :

Element	Ele	ctronic	configu	ration	No. of	Its	No. of electrons in ion	Type of ion	Symbol of
	K	L	М	N	protons	type	No. of on	Type	its ion
1. ₁₂ Mg			*****		*******	*******	*****	*****	
2. ₁₅ P	*****	*****	*****				*****	*****	***************************************
3. ₁₈ Ar						*******			***************************************
4. ₁₇ Cl		*****						,	***************************************
5. ₁₉ K		*****	******			,,,,,,	*****		***************************************

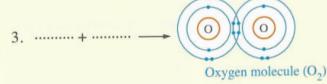
	Electro	nic config	uration	Molecule	Type of bond
Atom	K	L	M	Molecule	Type of bond
1. 🕮 11Na				NaCl	
17Cl				Naci	
2. ₁₂ Mg				MgO	
₈ O					
3. 🕮 7N				N ₂	
4. ₈ O				O ₂	

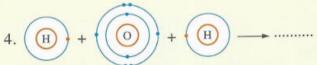
6. Complete the following figures and write the type of the bond:



Chlorine molecule (Cl₂)







7. Give reasons for :

- 1. The number of electrons of an ion differs from that of its atom.
- 2. When an atom loses an electron or more, it becomes a positive ion.
- 3. When an atom gains an electron or more, it becomes a negative ion.
- 4. The number of energy levels in the ion of a metallic element is less than the number of energy levels in its atom.
- A sodium atom (11Na) tends to form a positive ion, while oxygen atom (80) tends to form a negative ion.
- 6. Noble gases don't participate in chemical reactions under the ordinary conditions.
- 7. Both sodium ion and oxygen ion have the same number of electrons.
- 8. The bond in a molecule of magnesium oxide (MgO) is an ionic bond [regarding that the atomic number for magnesium (Mg) = 12 and oxygen (O) = 8].



- 9. It is impossible to combine sodium and magnesium together to form a compound.
- 10. In Ionic bonds produce compounds only not elements, but the covalent bonds may produce both types an element or even a compound.
- 11. When an atom of chlorine (17Cl) is joined with an atom of sodium (11Na), the product will be an ionic compound, but when two atoms of chlorine are joined together, the product will be a covalent molecule.
- 12. The bond in a hydrogen (H₂) molecule is a single covalent bond.
- 13. The bond in an oxygen (O₂) molecule is a double covalent bond.
- 14. The bond in a water (H₂O) molecule is a single covalent bond.
- 15. The bond in a nitrogen (7N) molecule is a triple covalent bond.

8. What is meant by ...?

- 1. Metals. 2. Nonmetals.
- 4. Negative ion. 5. The ion.
- 7. Ionic bond. 8. Covalent bond.
- 10. Double covalent bond.

- 3. Positive ion.
- 6. Noble (inert) gases.
- Single covalent bond.
- 11. Triple covalent bond.

9. What happens when ...?

- 1. You hammer a piece of carbon and why?
- 2. An atom loses one electron or more.
- 3. An atom gains one electron or more.
- 4. An oxygen atom combines with a magnesium atom.
- 5. A chlorine atom combines with a hydrogen atom.
- 6. Two oxygen atoms combine together.

10. Choose the odd word (or symbol) out, then mention the scientific name of the rest:

1. Magnesium / Sodium / Mercury / Aluminium.

- 4. Hydrogen / Oxygen / Nitrogen / Graphite.
- 5. Oxygen / Nitrogen / Chlorine / Sodium.

8. Nitrogen molecule / Table salt molecule / Hydrogen molecule / Oxygen molecule.

11. Write down the electronic configuration of the atoms of the following elements:

$$(_{18}Ar - _{12}Mg - _{16}S)$$

Then indicate:

- 1. The type of each atom (Metal Nonmetal Noble).
- 2. The type of each ion (Positive Negative Has no ions).

12. Write the electronic configuration of each of the following atoms:

$$\binom{1}{1}H - \binom{1}{1}Na - \binom{1}{7}N - \binom{1}{10}Ne - \binom{1}{8}O - \binom{1}{17}Cl - \binom{1}{19}K$$

Then indicate:

- 1. The type of each element (Metal Nonmetal Noble gas).
- 2. The type of ion for each of them (Positive Negative No ions).
- 3. How the bond is formed between:
 - a) Two hydrogen atoms.
- b) Two nitrogen atoms.
- 4. The element that has no ability to form a bond is (Complete).

13. Compare between:

- 1. An atom and an ion.
- 2. Metals and nonmetals.
- 3. Mercury and bromine [According to: Type of element Physical state Luster].
- Aluminium and graphite [According to: Electric conduction Heat conduction Ability to malleable and ductile].
- 5. Positive ion and negative ion.
- 6. In Ionic bond and covalent bond.
- 7. Single, double and triple covalent bonds.

14. Mention one difference between:

- 1. Graphite and oxygen.
- 2. (Na) and (Na+).
- 3. (O₂) and (2O).

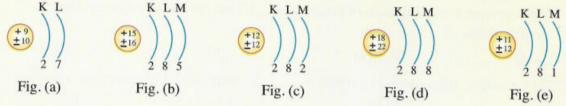
15. Mention the properties of :

1. Metals.

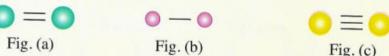
- 2. Nonmetals.
- You see one of the iron smiths hitting a rod of iron without being broken, but if somebody hits a piece of coal, it will be easily broken into pieces. How do you explain?



- 17. Draw a diagram showing the electronic configuration of the atom of oxygen (160), then show how two of its atoms are bonded to form oxygen molecule (O₂).
- 18. Show by drawing the combination between each of the following and mention the type of bond.
 - 1. Hydrogen (1H) and oxygen (8O) to form water molecule.
 - Magnesium (₁₂Mg) and oxygen (₈O) to form magnesium oxide molecule.
 - 3. Oxygen (80) and calcium (20Ca) to form calcium oxide molecule.
 - 4. Sodium atom (11 Na) and chlorine atom (17 Cl) to form sodium chloride molecule.
 - 5. Two hydrogen atoms (1H) to form hydrogen molecule.
 - 6. Two nitrogen atoms (7N) to form nitrogen molecule.
- 19. The following figures represent some atoms. Answer the following questions:



- 1. Find the type of element and ion if it is present of each of them.
- 2. Find the No. of electrons which lost or gained during the chemical reactions in each of them.
- 3. Which of these atoms is a good conductor of heat and electricity.
- 20. The following figures represent three molecules, whose atoms combine together by covalent bonds.



- Which of these figures represents :
- Hydrogen molecule.
- 2. Oxygen molecule.
- 3. Nitrogen molecule.
- 21. Two elements (X and Y) have atomic numbers (11 and 17) respectively:
 - 1. Show by drawing how the chemical bond is formed between them.
 - 2. What is the type of this bond?

Thinking Skills

Questions

1. Choose the correct answer:

1. The cables of electric wires are made up of an element, whose atomic number is

a. 10

b. 7

c.13

d. 17

2. From the opposite two figures:

The charge of each of the two ions is

a. -2

b. -1

c. +1

 $d_{1}+2$



3. The number of electrons in the outermost energy level of oxygen ion equals the number of electrons in the outermost energy level of

a. $\binom{40}{20}$ Ca) ion.

b. $\binom{14}{7}$ N) atom.

c. (35Cl) atom.

d. $\binom{32}{16}$ S) atom.

4. The electronic configuration of potassium (19 K) ion is similar to the electronic configuration of ion.

a. ₈O

b. 11Na

c. 18Ar

d. 17C1

5. The element, whose atomic number is forms an ionic bond with oxygen.

a. 2

b. 10

c. 12

d. 16

6. Nonmetal element its nucleus contains 18 neutrons, its electrons revolve in 3 energy levels and it tends to gain one electron during chemical reactions, its mass No. equal

a. 17

b. 18

c. 35

d. 40

The following figures represent the electronic configuration of the outermost energy level of four atoms of elements, whose electrons revolve in three energy levels.



(S)



(R)



Element (O)



Element (P)

Answer the following questions:

- 1. What are the elements which are considered from metals?
- 2. What is the element which forms an ion from the type (M+3)?
- 3. What is the type of the ion which the element (R) forms ? (Give a reason).
- 4. What is the element, whose nucleus contains 11 protons ? (Give a reason).



3. Give reasons for :

- 1. Jewellery is made up of some metallic elements.
- 2. Some metals are used in manufacturing some cooking pots.

"A, B, C and D" are four elements, whose atomic numbers are "1, 11, 10 and 17" respectively.

- 1. Classify them into metal, nonmetal and noble gas.
- 2. Show by drawing how two atoms of (A) form a covalent bond.
- 3. What is the type of bond when (B) combines with (D)?
- 4. What is the type of bond when two atoms of (D) combine together?
- 5. Explain why element (C) doesn't undergo chemical reaction under normal conditions?

5. Two elements (₈A) & (₁₂B):

- 1. Which one is a metal and which one is a nonmetal?
- 2. What is the kind of bond formed between the two atoms of (A)? Show by drawing.
- 3. Show by drawing the bond formed between (A) and (B) elements and mention the name of the formed compound.

6. Show the electronic configuration of the following atoms, then mention the atomic number and the type of element for each one:

- 1. An element atom that gains two electrons in the outermost energy level (L) during the chemical reaction.
- An element atom whose electrons distribute in 4 energy levels and its ion carries one positive charge.
- 3. An element atom whose electrons distribute in 3 energy levels and the symbol of its ion is (X^{-3}) .
- 4. An element atom loses two electrons during the chemical reaction, so (M) level becoms the outermost energy level of its ion.

Questions 2 on lesson Two

• Remember • Understand • Apply . Higher skills . School book questions.



Choose the correct answer:

	choose the correct disv	ver .		
	1 elements are the r	nost stable elements.		
	a. Metals b. No	onmetals c. Noble g	gases d. Metalloids	
	2. When a nonmetal gains of	r shares by two electrons,	its valency will be	
	a. monovalent. b. div	valent. c. trivalen	t. d. tetravalent.	
	3. All of the following eleme	ents are monovalent, excep	ot	
	a. hydrogen. b. soo	dium. c. oxygen	d. chlorine.	
	4. All of the following eleme	ents are divalent, except		
	a. ₁₂ Mg b. ₇ N	c. ₈ 0	d. ₁₆ S	
	5. When an atom loses, gain	s or shares with one electr	on, whose valency is	
	a. monovalent. b. div	valent. c. trivalen	t. d. tetravalent.	
	6. The valency of ferrous is			
	a. monovalent. b. div	valent. c. trivalen	t. d. tetravalent.	
	7. All of the following are no	onmetals having more than	one valency, except	
	a. copper. b. phe	osphorus. c. sulphur	d. nitrogen.	
	8. In trivalent elements, the	outermost energy level con	ntains electrons.	
	a. (3) or (5) b. (5)	or (6) c. (7) or (7)	d. (6) or (3)	
	9. The valency of argon (18	Ar) is		
	a. trivalent. b. div	valent. c. monova	d. zero.	
	10. The valency of copper in	(Cu ₂ O) is		
	a. monovalent. b. div	valent. c. trivalen	t. d. tetravalent.	
	11. The chemical formula of			
	3	$(O_4)^{-}$ c. $(NH_4)^+$	2	
	12. All of the following are n			
	a. phosphate b. nit			
•	13. Which of the following is			
	The state of the s	lphate. c. Ammor		
	14. Nitrate and nitrite groups			
		mber of atoms. c. valency		
	15. Phosphate and sulphate g			
	a. type of atoms. b. va	lency. c. number	of atoms. d. no correct answer	Γ.



1	6. The nitrate group i	s a group.		
	a. monovalent	b. divalent	c. trivalent	d. tetravalent
1	7. All of these atomic	groups carry the san	ne charge, except	
	a. nitrite.	b. nitrate.	c. bicarbonate.	d. ammonium.
1	8. The molecules of so of in each	odium hydroxide, water of them.	er and sulphuric acid	share in the presence
	a. hydrogen and ni		b. oxygen and sodi	um
	c. hydrogen and ox		d. hydrogen and so	
1	9. The chemical form	ula of carbon dioxide(CO ₂) shows that the	valency of carbon is
	a. monovalent.		c. trivalent.	
2	0. Element (M) forms	s a compound M(OH)	so, its valency is	
	a. monovalent.		c. trivalent.	
2	1. The chemical form	nula of calcium bicarb	onate is	
	a. CaCO ₃	b. CaH(CO ₃) ₂	c. Ca(HCO ₃) ₂	d. Ca ₂ HCO ₃
2	2. Each aluminium at aluminium chlorid	tom (13Al) combines		f chlorine (17Cl) to form
	a. two	b. three	c. four	d. five
2	3. The chemical form	ula of sodium hydrox	tide is	
	a. NaOH	b. NaCO ₃	c. NaHCO ₃	d. Na ₂ (CO ₃) ₂
2	4. The chemical form	nula of sulphuric acid	is	2 32
	a. H ₂ O	b. HCl	c. H ₂ SO ₄	d. HNO ₃
2	5. Sulphuric acid is c	omposed of ·····		
		ree different elements		
		e different elements.		
		hree different elemen		
		our different elements.		
2		ule (NH ₃), the number		
	a. N & H atoms in		b. H atoms in one	
2	c. the valency of hy		d. N atoms in one	molecule.
2		ula of sodium nitrite		
2	a. NaNO	b. NaNO ₃		d. Na ₂ NO ₃
2	a. monovalent.	(NO ₃) ₂ , the valency		
2		b. divalent.	c. trivalent.	
2	a. 5	ms in ammonium nitr		
		b. 7	c. 8	d. 9

30. When an acid dissolves in water, it producesions.	
a. (OH) ⁺ b. H ⁻ c. H ⁺ d. (OH) ⁻	
31. When an alkali (base) dissolves in water, it gives ions.	
a. H^+ b. $(OH)^-$ c. $(OH)^{-2}$ d. $(OH)^+$	
32. All of these substances turn litmus paper into red, except	
a. HCl b. HNO ₃ c. NaOH d. H ₂ SO ₄	
33. Mona bought a cup of yogurt and found the taste is sour, so she concluded that it	
contains a compound from	
a. acids. b. bases. c. salts. d. oxides.	
34. All of these substances turn litmus paper into blue, except	
a. NaOH b. KOH c. Ca(OH) ₂ d. HBr	
35. All of the aqueous solutions of the following compounds have bitter taste, except	
a. sodium hydroxide. b. sulphuric acid.	
c. calcium hydroxide. d. potassium hydroxide.	
36. All of these are nonmetal oxides, except	
a. CO_2 b. P_2O_5 c. SO_3 d. Al_2O_3	
37. Sodium chloride is	
a. an acid. b. an oxide. c. a base. d. a salt.	
38. The salt that is formed on the combination of a positive metal ion with a negative	
atomic group is	
a. NaCl b. Na ₂ CO ₃ c. (NH ₄) ₂ SO ₄ d. NaBr	
39. On the combination of $(Mg)^{+2}$ ion with $(CO_3)^{-2}$ group, is formed.	
a. an acid b. a base c. an oxide d. a salt	
40. The salt that is formed on the combination of a positive atomic group with a negative	/e
atomic group is	
a. NH_4Cl b. $(NH_4)_2CO_3$ c. Na_2SO_4 d. NH_4Br	
41. Ammonium chloride salt is formed on the combination of	
a. a positive metal ion with a negative atomic group.	
b. a positive metal ion with a negative nonmetal ion.	
c. a negative nonmetal ion with a positive atomic group.	
d. a negative nonmetal ion with a negative nonmetal ion.	
42. All of these salts dissolve in water, except	
a. sodium chloride. b. potassium sulphate.	
c. silver chloride. d. sodium sulphide.	



2. Choose from column (B) what suits it in column (A):

(A)	(B)
1. $(PO_4)^{-3}$	a. Nitrate group.
2. (OH) ⁻	b. Bicarbonate group.
$3. (CO_3)^{-2}$	c. Nitrite group.
4. (NO ₃) ⁻	d. Sulphate group.
$5. (SO_4)^{-2}$	e. Carbonate group.
6. (HCO ₃) ⁻	f. Ammonium group.
7. (NO ₂) ⁻	g. Phosphate group.
8. (NH ₄) ⁺	h. Hydroxide group.

3. Choose from columns (B) & (C) what suit them in column (A):

(A)	(B)	(C)
1. Sulphuric acid	a. KOH	A. A salt dissolves in water.
2. Sodium sulphide	b. H ₂ SO ₄	B. Its solution changes the colour of
3. Lead iodide	c. Na ₂ S	litmus paper into blue.
4. Potassium hydroxide	d. PbI ₂	C. Its solution changes the colour of litmus paper into red.
		D. A salt doesn't dissolve in water.

(A)	(B)	(C)
(Common name)	(Chemical name)	(Chemical formula)
1. Caustic soda	a. Sodium hydroxide.	A. NaCl
2. Table salt	b. Calcium hydroxide.	B. NaOH
3. Limewater	c. Sodium chloride.	C. Ca(OH)

4. Put (✓) or (×) in front of the following statements and correct the wrong

	1. An element of atomic number 20, so its valency is divalent.	()
•	2. Ferrous carries three negative charges.	()
•	3. Water molecule consists of four atoms for two elements.	()
	4. The valency of noble gases is monovalent.	()
	5. The atomic group acts as a compound in the chemical reaction.	()

•	6. Both nitrate and nitrite groups have the same valency.	()
	7. The chemical formula indicates the type and the number of atoms in		
	a certain molecule.	()
	8. The chemical formula of carbonate group is (HCO ₃) ⁻	()
e	9. In the compound (XY ₂), (Y) is divalent and (X) is monovalent.	()
ļ	10. A compound (X_2O_3) , so the valency of element (X) is monovalent.	()
	11. Both lithium bicarbonate and sodium carbonate have the same number of atoms.	()
	12. The molecule of sodium sulphate consists of three different elements.	()
	13. The chemical formula of calcium carbonate is (CaCO ₃).	()
	14. The chemical formula of aluminium sulphate is Al ₃ (SO ₄) ₂	()
	15.(SO ₂) is the symbol of sodium oxide.	()
	16. The chemical formula of silver nitrate is (AgNO ₃)	()
	17. The valency of sodium in (NaCl) is monovalent, while it is divalent in (Na2CO3).	()
	18. Table salt is formed of two divalent elements.	()
	19. The chemical formula of calcium hydroxide molecule is (CaOH).	()
	20. The chemical formula of nitric acid is (HNO ₃), while that of sulphuric acid is (H ₂ S).	()
	21. The valency of sulphur in sulphur trioxide (SO ₃) is tetravalent.	()
	22. Oxides are substances that dissociate in water producing positive hydrogen ions.	()
·	23. Sodium hydroxide changes the colour of litmus paper into red.	()
·	24. Mineral acids are formed when hydrogen joined with a negative atomic		
	group except nitrate group.	()
d	25. When an element (11Z) combines with oxygen, it produces (ZO) oxide which	,	,
	is a metal oxide.	()
1	26. Aluminium oxide is a metal oxide, while carbon dioxide is a nonmetal oxide.	(,
1	27. Caustic soda and limewater are from bases, while magnesium carbonate	()
	is from salts.	,	,
i	28. The combination of metals with oxygen form oxides, while the combination of metals with nonmetals form bases.	()
	29. Sodium chloride is considered a base.	()
Ì	30. Silver chloride is water soluble, while sodium chloride is water insoluble.	()
j			
	Write the scientific term of each of the following:		
	1. The number of electrons gained, lost or even shared with an atom during		
	a chemical reaction.		
	2. Elements, their valencies are zero.		



•	 A set of atoms joined together, behave like one atom only, having a certain valency and it can't be existed solely.
•	4. A formula represents the number and the type of atoms in a molecule.
•	 Compounds are dissolved (dissociated) in water producing positive hydrogen ions H⁺.
	 Compounds have sour taste and turn litmus paper into red.
	6. • Compounds (substances) are dissociated in water producing negative hydroxide ions (OH)—.
	 Compounds have bitter taste and turn litmus paper into blue.
	Compounds resulted from the combination between oxygen and an element even though it is a metal or a nonmetal.
•	8. Oxides produced due to the combination of oxygen with a metal.
•	9. Oxides produced due to the combination of oxygen with a nonmetal.
•	10. Compounds produced as a result of the chemical combination of a positive metal ion (or a positive atomic group) with a negative atomic group (or a negative nonmetal ion except oxygen).
6	Complete the following statements :
•	1. The valency of metals may be or trivalent as their outermost energy shells have 1, 2 or 3 electrons.
•	2. The valency of aluminium (27 Al) is, while that of calcium (40 Ca) is
•	3. Some metallic elements have more than one valency, such as and
•	4. The valency of iron is in ferrous chloride, while in ferric chloride is
•	5. Some nonmetallic elements have more than one valency such as,, and
٠	6. The valency of a sulphur atom may be or
•	7. Phosphorus element has two valencies which are and
	8. The valency of noble gases is as their outermost energy level is with electrons.
÷	9. The valency of $\binom{39}{19}$ K) is, while the valency of $(SO_4)^{-2}$ is
	10 and are examples of monovalent atomic groups, while and are examples of divalent atomic groups.
•	11. The valency of a carbonate group is, while that of a bicarbonate group is
•	12. The symbol of phosphate group is and its valency is
	13. The symbol of sulphate group is and it is formed of atoms of different elements.

- 14. The difference between nitrate group and nitrite group is one atom. 15. The chemical formula of sodium carbonate is and it consists of atoms of different elements. 16. If the chemical formula of aluminium sulphate is $Al_2(SO_4)_3$, so the valency of aluminium atom is, while the valency of sulphate group is 17. The chemical formula of magnesium sulphate is, while that of calcium nitrate is 18. The chemical formula of hydrochloric acid is, but the chemical formula of sodium hydroxide is 19. The chemical formula of water is, but the chemical formula of sulphuric acid is 20. A compound has a chemical formula (XO_2) , so the valency of (X) is 21. The valency of calcium is and when it combines with phosphate group, a compound is formed its formula is 22. (Na2O) is the chemical formula of, while the chemical formula of magnesium carbonate is 23. The valency of sodium in sodium carbonate (Na2CO3) is and its valency in sodium chloride (NaCl) is 24. Compounds are classified according to their properties into, bases, and 25. On dissolving in water, acids give positive ions and alkalis give negative
 - 25. On dissolving in water, acids give positiveions and arkans give negativeions.
 - 26. Acids have taste and change the colour of litmus paper into, while bases have taste and change the colour of litmus paper into
 - 27. and are examples of bases.
 - 28. is from acids that contains oxygen, while is from acids that doesn't contain oxygen.
 - 29. (H₂SO₄) is, while (NaOH) is
 - 30. The symbols of all mineral acids begin with atom, while the symbols of all bases end with group.
 - 31. is an example of metal oxides, while is an example of nonmetal oxides.
 - 32. Sodium sulphide is from the salts that in water, while lead sulphate is from the salts that in water.



7. Complete the following table:

Compound	Chemical formula	No. of atoms in the molecule	No. of elements forming the molecule	Its type
1. Sodium carbonate				
2	CuCO ₃			
3. Sodium hydroxide			3	
4	Al ₂ (SO ₄) ₃	17	**********	
5. Calcium oxide			********	
6	Mg(NO ₃) ₂		3	
7. Copper nitrite		*********	*********	
8. Aluminium hydroxide	********	7		
9	CaCO ₃	*********		
10. Sulphuric acid	*********	********		
11	MgO		p. 1415	
12. Sodium phosphate				**********

8. Give reasons for :

- 1. \square Potassium ($_{19}$ K) is monovalent, while oxygen ($_{8}$ O) is divalent.
- 2. Both sodium (11 Na) and chlorine (17 Cl) are monovalent although they have different atomic numbers.
- 3. The valency of noble gases is zero.
- 4. Magnesium (12Mg) is divalent, while aluminium (13Al) is trivalent.
- 5. An oxygen atom combines with two atoms of sodium when composing one molecule of sodium oxide.
- The chemical formula of sodium carbonate is (Na₂CO₃).
- 7. The chemical formula of water is (H₂O).
- 8. Acids have an effect on litmus paper which is different from bases.
- 9. All acids turn the colour of litmus into red and having a sour taste, while all bases turn the colour of litmus into blue with a bitter taste.
- 10. We can obtain sodium chloride (NaCl) solution and not silver chloride (AgCl) solution.
- 11. Caustic soda is from bases, while lead bromide is from salts.

What is meant by each of the following ... ?

- 1. Valency.
- 3. Fe⁺³
- 5. Atomic group.
- 7. Acids.
- 9. Oxides.
- 11. Nonmetal oxides.

- 2. Magnesium (12Mg) is a divalent element.
- 4. A trivalent nonmetallic element.
- 6. Chemical formula.
- 8. Bases.
- 10. Metal oxides.
- 12. Salts.

10. Choose the odd word (or formula) and mention the relation between the rest:

- 1. Lithium / Silver / Aluminium / Sodium.
- 2. Calcium / Magnesium / Lead / Oxygen.
- 3. Phosphorus / Nitrogen / Sulphur / Chlorine.
- 4. Bromine / Chlorine / Iodine / Potassium.
- 5. Zinc / Calcium / Mercury / Aluminium / Lead.
- 6. Ammonium / Phosphate / Carbonate / Nitrate.
- 7. NaOH / Ca(OH), / KOH / HCl
- 8. Al₂O₃ / SO₃ / SO₂ / CO₂
- 9. K₂O / Al₂O₃ / SO₃ / CaO
- 10. H2O / HBr / HCl / HNO3
- 11. NaCl / K₂SO₄ / AgCl / Na₂S

11. Give an example of each of the following:

- 1. A monovalent metallic element.
- 3. A divalent nonmetallic element.
- 5. An element, its valency is zero.
- 7. A trivalent atomic group.
- 9. A base.
- 11. A metal oxide.
- 13. A salt doesn't dissolve in water.

- 2. A monovalent nonmetallic element.
- 4. A trivalent nonmetallic element.
- 6. A monovalent atomic group.
- 8. A divalent atomic group.
- 10. An acid doesn't contain oxygen.
- 12. An acid contains oxygen.
- 14. A salt dissolves in water.
- 15. A compound turns the red litmus paper into blue.

12. Write the names of the following compounds and mention the number of atoms for each:

1. CaSO₄

2. LiHCO₃

3. Mg(OH)₂

4. H₂SO₄

5. Na₃PO₄

6. KNO₃



7. $Mg_3(PO_4)_2$	8. 🖂 CO ₂	9. Al ₂ (SO ₄) ₃
10. NaNO ₃	11. 🕮 Ca(OH) ₂	12. Ca ₃ (PO ₄) ₂
13. CaCO,	14. HCl	

13. Write the chemical formula for the following compounds:

 Sodium hydroxide. 	Sodium bicarbonate.	3. Sodium sulphate.
4. Copper nitrate.	5. Magnesium oxide.	6. Nitric acid.
7. Sulphuric acid.	8. Calcium hydroxide (Lin	newater).
9. Calcium bicarbonate.	10. Calcium sulphate.	11. Iron II (ferrous) oxide.
12. Potassium chloride.	13. Copper sulphate.	14. Aluminium oxide.
15. Calcium nitrate.	16. Silver nitrate.	17. Silver chloride.
18. Hydrochloric acid.	19. Table salt.	20. Calcium chloride.
21. Aluminium hydroxide.	22. Ammonium chloride.	23. Potassium sulphate.
24. Sodium carbonate.	25. Sodium oxide.	26. Potassium carbonate.
27. Sulphur trioxide.	28. Water.	

14. Mention the properties of :

1. Acids. 2. Bases.

15. Identify the type of the following compounds:

1. 🛄 KOH	2. A NaCl	3. III MgO	4. H ₂ SO ₄
5. CO ₂	6. NH ₄ Cl	7. HBr	8. Ca(OH) ₂
9. SO ₃	10. PbSO ₄	11. HNO ₃	12. PbBr

16. Compare between:

- 1. Acids and bases [giving examples of each].
- Carbonate group and bicarbonate group [According to : Chemical formula Valency Number of atoms].
- Potassium sulphate and lead sulphate [According to : Chemical formula Solubility in water].
- 4. Metal oxides and nonmetal oxides.
- Once you collected an amount of rain water and another amount of sea water, and placed a litmus paper in each sample of water.

 You observed that its colour changed into red in case of rain water where it changed into blue in case of sea water. Explain.

18. Form the following formulae from [H, K, SO₄, OH].

- 1. A chemical formula for an acid.
- 2. A chemical formula for a base.
- 3. A chemical formula for a salt.

19. Mention the valency of sulphur in the following compounds, and mention their type:

- 1. SO3
- 2. SO₂

- 3. Na₂S
- $4.H_2S$

20. If you have an element $\binom{39}{19}$ X:

- 1. Mention its kind. Why?
- 2. Mention its valency (give a reason).
- 3. Write the chemical formula of its oxide.
- 4. Complete: It combines with sulphate group to give salt.

21. Two elements (X) and (Y), their atomic numbers are 11 and 17 respectively, answer the following questions:

- 1. Write the electronic distribution of each one.
- 2. What is the valency of each one? (give a reason).
- 3. What is the type of the compound produced due to their combination?

22. If you have four elements $\binom{9}{9}$ X , $\binom{7}{13}$ Y , $\binom{7}{7}$ Z , $\binom{20}{20}$:

- Write the electronic distribution of each one, then conclude the type and the valency of each element.
- 2. What is the type of the compound produced from:
 - a) Combination between element (X) and element (Y).
 - b) Combination between element (Y) and oxygen (80), write the chemical formula.
- 3. What is the type of the combination resulted between element (X) and element (Q)?
 Write the chemical formula of the produced compound.

23. Element (X) combines with oxygen forming (X20) oxide:

- 1. Mention the valency of this element.
- 2. What is the type of the produced oxide?



24. Study the following figures, then answer the following questions:

1) Look at the following diagrams, then answer:



Element (A)

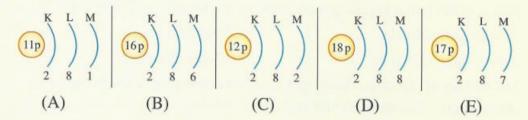


Element (B)

- 1. Mention the valency of two elements (give a reason).
- 2. Write the name and the chemical formula for the compound, which is produced from the combination between element (A) and element (B).
- (2) Choose the suitable diagram for each of the following statements:
 - 1. A divalent metallic element.

 - 3. A noble gas.

- A divalent nonmetallic element.
- 4. A monovalent nonmetallic element.
- 5. A monovalent metallic element.



- (3) If you have four tubes as in the figure, answer the following questions :
 - 1. Write the chemical formula of each one.
 - 2. Identify the type of each of them.
 - 3. What is the effect of putting blue litmus paper on tubes (2) and (3)?
 - 4. What happens by adding water to tube (1) with shaking?
 - 5. What is the type of chemical bond in the compound of tube (4)?



nitrate (I)







Thinking Skills

Questions

1. Choose the correct answer:

- 1. The atom of element changes into negative ion carries one negative charge during the chemical reaction.
 - a. F

- b. Fe
- c. C

- d. Ag
- 2. The number of atoms equals the number of elements in the molecule of
 - a. sodium hydroxide. b. water.
- c. calcium sulphate.
- d. sodium nitrate.
- 3. The atomic group that is formed of the same elements of water is
 - a. carbonate.
- b. hydroxide.
- c. sulphate.
- d. nitrate.
- 4. When an element (13X) combines with oxygen atom, the symbol of the produced oxide is
 - a. XO
- b. X₂O₂
- c. X₂O
- d. X₃O₂
- 5. Which of the following compounds contains the largest number of atoms?
 - Sodium hydroxide.

b. Sulphuric acid.

c. Aluminium sulphate.

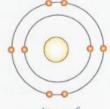
- d. Carbon dioxide.
- 6. The number of electrons which exist in an ion of trivalent nonmetal element, the electrons of its atom revolve in 3 energy levels is
 - a. 8

- b. 10
- c. 18

- d. 20
- 7. From the opposite two figures, when element (X) combines with element (Y) produce
 - a. XY
- b. XY₂
- c. X₆Y



Atom of element (X)



Atom of element (Y)

Complete the following statements:

- 1. The metallic element (X) that reacts with oxygen forming a compound, whose formula is (XO) and has two energy levels, so its valency is and its atomic number equals
- 2. If the formula of oxide of element (M) is (MO), so the formula for its nitrate is and the formula of its phosphate is



- 3. A metallic element (X), its outermost energy level is M and its valency equals the number of energy levels of its ion and its mass number is doubled its atomic number. Find:
 - 1. a. The atomic number.
 - b. The mass number.
 - c. The valency of the element.
 - 2. Write the chemical formula for the compound molecule that is resulted from the combination of this element with oxygen.
- 4. A metallic element (X), whose electrons are distributed in three energy levels reacts with oxygen ($_{g}$ O) forming a compound, whose formula is (XO). Answer the following questions:
 - 1. Find the atomic number and the valency of element (X).
 - 2. Mention the type of the ion of element (X) and the number of charges that it carries.
 - 3. What is the type of chemical bond in the compound (XO)?
 - 4. Choose:
 - (1) The ion of the element (X) combines with forming salt.
 - a. Na+
- b. Ar
- c. (NH₄)+
- (2) When the ion of element (X) combines with sulphate group, a compound is formed, its formula is
 - a. $X(SO_4)_3$
- b. $X_2(SO_4)_3$ c. XSO_4
- A metallic element (X) combines with chlorine element forming a compound, whose formula is (XCl3), if the number of energy levels in this element equals to the number of electrons in outermost energy level of its atom. Determine:
 - 1. The atomic number and the valency of element (X).
 - 2. The type of chemical bond in the compound (XCl₃).
 - 3. The type of compound (XCl₃).
 - 4. The chemical formula for hydroxide of element (X).

Chemical Combination

Worksheet

1. Complete the following:

1	. is the only liquid nonmetal element, while	is the only liquid metal
element.		(Port Said 2019

- 2. During the chemical reaction, magnesium atom (24Mg) two electrons and changes into
- 3. The outermost energy level of chlorine atom (35Cl) contains electrons, while that of chloride ion contains electrons.
- 4. Nonmetals are conductors of electricity except which is a good conductor of electricity.
- 5. Elements can be classified according to their properties and electronic structure into and

2. Choose the correct answer:

- 1. All of the following elements change into negative ions during chemical reactions , except
 - a. 35Cl
- b. 160
- d. 24Mg
- 2. Which of the following figures represents the structure of aluminium ion ? (Fig.)

$$\begin{array}{c}
K & L \\
a. \begin{pmatrix} +13 \\ \pm 14 \end{pmatrix} \\
2 & 8
\end{array}$$

- $c.\begin{pmatrix} +13 \\ \pm 14 \end{pmatrix}$ $d.\begin{pmatrix} +14 \\ \pm 13 \end{pmatrix}$
- 3. Which of the following figures represents the structure of nitrogen ion ? (Fig.)



- C. (+8)
- 4. During chemical reactions, oxygen atom (160) gains electrons and changes into
 - a. O -
- b. O+
- c. O-2
- $d.0^{+2}$
- 5. The following elements are good conductors of electricity, except
 - a. _gO
- b. 11 Na
- c. 12Mg
- d. 13Al



3. A. Write the scientific term for each of the following	:
1. The atom which gained an electron or more during	
	il Sch./ Aswan 2022) ()
2. The atom which lost an electron or more during th	
Elements don't participate in chemical reactions d outermost energy level. (Hafr El-bate)	(Fayoum 2019) () ue to the completeness of their en Sch. / Giza 2019) ()
B. Put (✓) or (x), then correct what is wrong :	,
1. The number of energy levels in positive ion is mor	re than that of its atom
During the chemical reaction, sodium atom loses t positive ion.	wo electrons and changes into
3. The outermost energy levels of metals contain 5, 6	5 or 7 electrons. ()
A. Give reasons for: 1. When an atom gains an electron or more during the a negative ion.	(Beni Suef 2019)
2. Both aluminium ion and nitrogen ion have the same [knowing that : $^{27}_{13}$ Al & $^{14}_{7}$ N].	e number of electrons.
3. Both sulphur ion and calcium ion have the same nur	mber of energy levels.
[knowing that : $_{16}$ S & $_{20}$ Ca].	
B. Mention the characteristics (properties) of metals.	
the operates) of metals.	

1. The opposite figure shows the electronic configuration of ion of an element. 1. Mention the type of the element and its atomic number. 2. What is the number of protons in this ion? 3. What is the type of the bond formed from the combination of this ion with negative chloride ion? 2. A. What is meant by ...? 1. Ionic bond: 2. Covalent bond : B. Give reasons for: 1. The bond in a hydrogen molecule is a single covalent bond. 2. The chlorine atom (17Cl) tends to combine with potassium atom (19K) by an ionic bond. 3. Complete the following: 1. During the formation of NaCl molecule, atom loses an electron which is gained by atom. 2. The bond in sodium chloride molecule is bond, while the bond in nitrogen (Rod El-Farag Zone / Cairo 2022) molecule is bond. 3. The ion of metallic element is charge, while the ion of nonmetallic element is charge.

UNIT Lesson Two

Chemical Compounds

Worksheet 3

1. Complete the followi	ng:		
1. The valency of ferr	ric is, while t	hat of ferrous is	
	ula of sodium hydroxi		
3. During chemical re	eactions, oxygen atom	can or	two electrons.
			l its valency is
	cule is formed of com		
2. A. What is meant by	?	(.	Science Inspectorate / Qena 2022)
1. Valency:		***************************************	
			(El-Gomrok Zone / Alex. 2019)
B. Write the chemica	l formula of each of t	he following:	
1. Aluminium carb	onate:		(Cairo 2019)
2. Sodium sulphate	e:		(New Cairo Zone / Cairo 2019)
3. Magnesium hyd	roxide:		(El-Dokki Zone / Giza 2019)
4. Ammonium carl	oonate:	(Patriarchal College / Cairo 2019)
Calcium phosph	ate:		(El-Dokki Zone / Giza 2019)
3. A. Choose the correct	t answer :		En a mar Hall
	g are monovalent atom	C groups aveant	
	b. bicarbonate.		
	rmula of calcium carbo		d. nitrite.
a. Ca ₂ CO ₃	b. CaCO ₃	c. CaCO ₂	d. CaSO ₄
B. Write the scientific	term for each of the	following:	
	different elements join	ned together and b	behave like one atom during

()
A. Rewrite the following statements after correcting them:	
1. Water molecule consists of two atoms of three different elements.	
2. The valency of carbon in (CO ₂) molecule is divalent.	
3. The valency of noble gases is monovalent.	
B. Give reasons for :	
1. Sodium is monovalent, while calcium is divalent. (El-Agamy Zone / Alex. 2	019)
Aluminium oxide molecule is composed of two aluminium atoms and three oxyg atoms.	en
Worksheet 4	
A. Write the scientific term for each of the following:	
 Compounds dissociated in water producing negative hydroxide ions. 	
(El-Agamy Zone / Alex. 2019) ()
Compounds produced as a result of the combination of a positive metal ion (or a positive atomic group) with a negative atomic group (or a negative nonmetal io	n
except oxygen). (Saint Mary Sch. / Cairo 2019) ()
B. Give reasons for :	
1. Acids turn the colour of litmus paper into red. (Al-Resala Sch. / Qalyoubia 2	019)
2. Limewater is from bases, while lead sulphate is from salts.	
. A. Complete the following :	
Bases change the colour of litmus paper into due to the presence of ions.	
Calcium nitrate is an example of water salts, while lead iodide is an example of water salts.	



B. How can you distinguish between two un the other contains a base ?	marked tubes, o	one contains an acid and
3. Choose the correct answer:		
1. When an element (11X) combines with oxygo	en the symbol o	the produced oxide
is	en, me symoor o	the produced oxide
a. XO b. X ₂ O	c. XO ₂	d. X ₂ O ₃
2. All of the following are water soluble salts,	except	2 3
	(Shebin El-	Kom Directorate / Menofia 2019)
a. sodium chloride.	b. sodium sulp	
c. silver chloride.	d. potassium si	ılphate.
3. Sulphuric acid is characterized by all of the	following, excep	ot
a. its chemical formula is (H ₂ SO ₄).	b. it is a miner	
c. it changes the colour of litmus into red.	d. it has a bitte	r taste.
4. A. Give an example for each of the following	1:	
1. Nonmetal oxide :		Science Inspectance / Cine 2022)
2. Water insoluble salt :		Science Inspectorate / Giza 2022)
3. Mineral acid:		(El-Agamy Zone / Alex. 2019)
4. Metal oxide :		
B. Compare between sodium hydroxide and s		
b. compare between souldin nydroxide and s	dipilaric acia.	
Sodium hydroxide	S	ulphuric acid

	*	

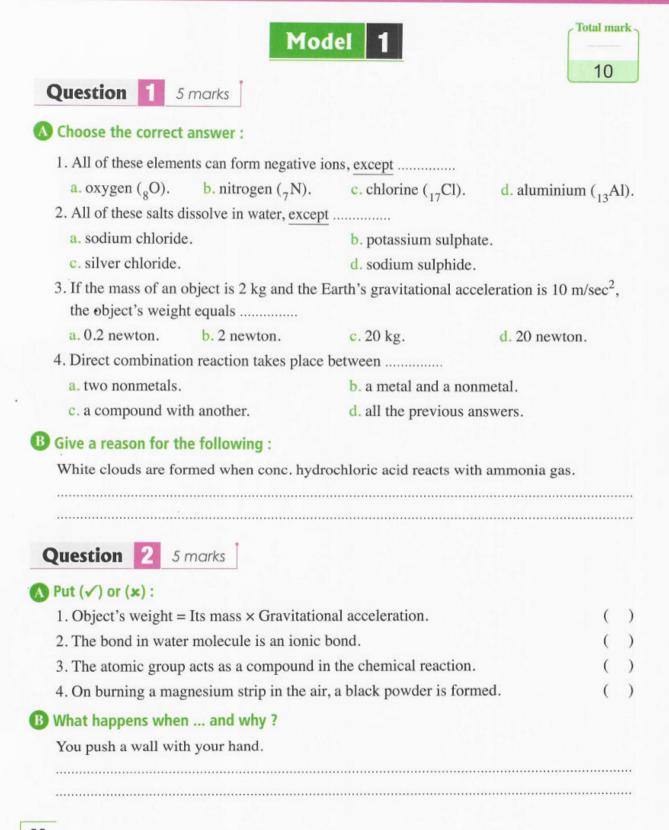
Worksheet 5 on Lessons 1 & 2 Unit One

Complete the following:	
1. The ion of iron II is called, while t	he ion of iron III is called
2. The ion of metallic element is char	ge, while the ion of nonmetallic element is
charge.	
3. The valency of metallic atoms indicates the r	number of electrons that are
during the chemical reaction, while the valen	cy of nonmetallic atoms indicates
the number of electrons that are or	
4. Inion, the number of protons in the	e nucleus is less than the number of
that rotate around it.	
2. Give reasons for :	
1. Argon element can't form positive ion or neg	gative ion in ordinary conditions.
2. We can differentiate between acids and bases	s by using litmus paper.
$oldsymbol{3}_{ullet}$ A. Identify the type of the following compou	nds:
1. SO ₃ :	
2. PbSO ₄ :	******
3. Ca(OH) ₂ :	
4. HNO ₃ :	(Brilliance Sch. / Alex. 2019)
B. Choose the correct answer:	
1. From properties of graphite element that	
a. it is a malleable and ductile.	b. it has a metallic luster.
c. it is a good conductor of electricity.	d. it is a good conductor of heat.
2. The changing of lithium atom (Li) into lit	hium ion (Li ⁺) means that it
a. gains proton. b. gains electron.	c. loses proton. d. loses electron.



	3. From properties of acids that
	a. they change the colour of red litmus paper into blue.
	b. they have a bitter taste.
	c. they give H ⁺ ions on dissociation in water.
	d. their aqueous solutions feel slippery.
4. A.	Write the chemical formula of the following compounds :
	1. Sodium oxide :
	2. Copper sulphate :
	3. Sodium carbonate :
	4. Hydrochloric acid:
B.	Define :
	1. The ion:
	(El-Dokki Zone / Giza 2019)
	2. Atomic group :

March Tests





Model 2

Total	mark-
-	
1	0

Question 1 5 marks		
Write the scientific term of each of the following:		
1. An atom that has lost an electron or more during the chemical reaction	1. (.)
2. A formula represents the number and the type of atoms in a molecule	e. (.)
3. The amount of Earth's gravitational pull on an object.	(.)
4. Oxides that cause building corrosion.	(.)
B Give a reason for the following:		
A chemical equation should be balanced.		
A Put (✓) or (x):		
Question 2 5 marks		
		,
Magnesium oxide is an ionic compound.	*)
2. The valency of sulphur in sulphur trioxide (SO ₃) is tetravalent.	()
Sulphur oxides and nitrogen oxides are acidic gases.	()
4. By increasing the ratio of (CO ₂), the air temperature decreases.	()
B The weight of an object on Mars is 32 newton and on Earth is 80 newt	ton. What's the	
gravitational acceleration on Mars if the gravitational acceleration on	Earth is 10 m/sec	2

		•••

Test

Total mark 10

A Choose the correct answer:	(8 marks)
1 During the chemical reaction, a magnes	ium atom (₁₂ Mg) loses its outer electrons
and changes into	
\bigcirc \mathbf{Mg}^+	(b) Mg ⁻
© Mg ^{+ 2}	\bigcirc Mg ⁻²
2 All of these atomic groups carry the san	ne charge, except
a nitrite.	(b) nitrate.
© bicarbonate.	d ammonium.
3 Ammonia combines with conc. HCl pro	ducing of ammonium chloride.
a white ppt.	b brown clouds
© white clouds	d brown ppt.
4 All of these substances turn litmus pape	r into blue, except
(a) HCl	(b) HNO ₃
© NaOH	\textcircled{d} H_2SO_4
B Give a reason for the following:	(2 marks)
A chemical equation should be balanced.	



Test 2

Total mark

A Choose the correct answer:	(8 marks)
1 All of these elements are metal solid	elements, except
a) sodium.	(b) magnesium.
© mercury.	d aluminium.
2 The covalent bond in an oxygen mol	ecule is abond.
(a) single	(b) double
© triple	d no correct answer
3 The valency of copper in (Cu ₂ O) is	
a monovalent.	(b) divalent.
© trivalent.	d tetravalent.
4 The bright magnesium ribbon change	es into white powder of when it burns
in air.	
a magnesium nitrite	(b) magnesium oxide
© magnesium hydroxide	d magnesium dioxide
B What happens if?	(2 marks)
Approaching a wet rod with hydrochlor	ic acid to ammonia gas.



Test 3

Total mark

A Choose the correct answer:		3 marks)
Direct combination reaction takes place.	a les) marks)
(a) two nonmetals.	(b) a metal and a nonmetal.	
© a compound with another.	d all of the previous answers	50
2 Sodium chloride is		
(a) an acid.	(b) an oxide.	
© a base.	(d) a salt.	
3 All of these salts dissolve in water, exc	cept	
a) sodium chloride.	(b) potassium sulphate.	
© silver chloride	d sodium sulphide.	
4 The covalent bond usually arises betw	een elements.	
(a) two metallic	(b) two nonmetallic	
© metallic and non metallic	d metallic and noble	
B What is meant by:		2 marks)
Positive ion.		
-0°	-00°	



Total mark

10

Test 4

A Choose the correct answer:	(8 marks)
1 The valency of ferrous is	
a monovalent.	(b) divalent.
© trivalent.	d tetravalent.
2 Ammonia combines with conc. HCl pro	oducing white cloudes of
a ammonium chloride.	b ammonium hydroxide.
© sodium chloride.	d aluminium hydroxide.
3 The number of atoms in ammonium nit	trate molecule equals
(a) 5	(b) 7
© 8	d 9
4 The molecule of a noble gas consists of	f
a two different atoms	(b) one atom.
© two similar atoms	d one or two similar atoms
B Write the chemical formula for the	e following compounds: (2 marks)
1 Sodium sulphate :	
2 Copper nitrate :	



Science

Test

Total mark 10

A Choose the correct answer:		(8 marks)
1 In the compound X (NO ₃) ₂ , the valen	cy of element (X) is	
a monovalent.	(b) divalent.	
© triavalent.	d tetravalent.	
2 The number of energy levels in sodium	n ion is the number of	f energy levels
in its atom.		
(a) less than	(b) more than	
© equal to	d no correct answer	
3 All of nonmetals don't conduct electric	city, except	
a bromine.	(b) aluminium.	
© graphite.	d mercury.	
4 The chemical formula of sodium hydro	oxide is	
(a) NaOH.	(b) NaCO ₃	
© NaHCO ₃	(d) Na ₂ (CO ₃) ₂	
B Knowing that the mass of carbon (C) is 1	2 and oxygen (O) is 16:	(2 marks)
Find the total mass of reactants ar	nd products through the	following
reaction:		
$C + O_2$	$\xrightarrow{\Delta} CO_2$	



Answers of Test



A 1 (c)

2 (d)

3 (C)

- **4** (c)
- B To acheive the law of conservation of matter (mass).

Answers of Test

A 1 C

2 (b)

3 (a)

- **4** (b)
- B White clouds of ammonium chloride are formed.

$$NH_3 + HCl \xrightarrow{conc.} NH_4Cl$$

Answers of Test

A 1 (d)

2 (d)

3 (c)

- **4** (b)
- B It is an atom of a metallic element that loses an electron or more during the chemical reaction.

Answers of Test



A 1 (b)

2 (a)

3 (d)

4 (b)

B 1 Na₂SO₄

2 Cu(NO₃)₂

Answers of Test

A 1 (b)

2 (a)

3 (c)

- **4** (a)
- **B** Mass of reactants = $12 + (2 \times 16) = 44$ gm.
 - Mass of products = $12 + (2 \times 16) = 44$ gm.

Science Second Term 2023/2024 Prep.1



February Revision

* (1) Write the scientific term:

Mr. Ahmed Elbasha

1)	malleable and ductile and they contain 1, 2 or 3 electrons in their outer electron shells.	()
2)	Compounds produced as a result of the combination of a positive ion with a negative ion except oxygen	()
3)	The only nonmetal that exists in a liquid state.	()
4)	The number of electrons gained, lost or even shared during a chemical reaction	()
5)	Compounds that dissolve in water producing positive hydrogen ions \mathbf{H}^{+}	()
6)	A bond resulting from the participation of each of the two atoms with three electrons	()
7)	A set of atoms behaving like one atom during the reaction.	()
8)	They are compounds resulted from the combination between oxygen and an element	()
9)	Substances dissociate in water and give negative hydroxide ions	()
10)	Compounds resulted from the combination between oxygen and an element even though it is a metal or a nonmetal	()
11)	Elements have more than 4 electrons in outer level.	()

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2

*(2) Choose the right answer:

1. All the following a	re covalent molecules ex	xcept	
a. H ₂ O	b. MgO	c. N ₂	d. O ₂
2. The triple covalent	t bond is formed in	molecule.	
a. hydrogen	b. nitrogen	c. oxygen	d. water
3. In positive ion, the	number of protons is	the number o	of electrons.
a. less than	b. more than	c. equal to	100
4. All of the following	g are metallic oxides exc	cept	
a. Na ₂ O	b. MgO	c. SO ₃	d. Al ₂ O ₃
5. The chemical form	nula of sodium hydroxid	le is	
a. HCl	b. Na ₂ CO ₃	c. NaOH	d. NaCl
6. All of the following	g are covalent molecules	s except	
a. H ₂ O	b. N ₂	c. NaCl	d. O ₂
7. The valency of hel	ium (2He) is		
a. zero	b. one	c. two	d. four
8. Sodium chloride n	nolecule is considered		
a. an acid.	b. an alkali.	c. an oxide.	d. a salt.
9. If (13Al) combines	with (8O), the chemical	formula of the formed	d compound is
a. Al ₃ O ₂	b. AlO	c.AlO ₂	d. Al ₂ O ₃
10. The type of bond	in nitrogen molecule is	bond.	
a. double covalent	b. single covalent	c. triple o	covalent d. ionic
11. The chemical for	mula of carbonate grou	p is	
a. (CO ₃) ⁻²	b. CO	c. (HCO ₃)	d. CO ²
12. The chemical for	mula of hydrochloric ac	eid is	
a. H ₂ O	b. HCl	c. H ₂ SO ₄	d. HNO ₃
13. The valency of ar	gon is		
a. zero.	b. monovalent.	c. divalent.	d. trivalent.
14. The chemical for	mula of sulphuric acid i	s	
a. HNO ₃	b. H ₂ SO ₄	c. HCl	
15. There is a single	covalent bond in	molecule.	
a. hydrogen	b. nitrogen	c. oxygen	

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*((3)	Comp	lete	the	follo	wing:

1.	Acids change the color of litmus paper into, while bases change the color
	of litmus paper into
2.	The chemical bond in hydrogen molecule (H_2) is a, while the chemical
	bond in nitrogen molecule (N ₂) is
3.	and are examples of monovalent atomic groups.
4.	The bond in oxygen molecule is bond,, while that in calcium oxide
	is bond.
5.	is an example for acids, while is an example for bases .
6.	Chemical formula of water is, while chemical formula of table salt is
7.	is the only liquid metal, while is the only liquid nonmetal.
8.	The bond in sodium chloride molecule (table salt) is
	molecule is
9.	The valency of 13Al is, while that of 20Ca is
10.	During chemical reaction, sodium atom tend to one electron and changes
	into
11.	The outer level in ₁₇ Cl has electron(s), so it forms ion.

*(4) Correct the underlined words:

1	Salts are substances that dissociate in water producing negative hydroxide ions (OH) ⁻ .	()
2	The chemical formula of sodium chloride is AgCl	()
3	Nonmetals are bad conductors of electricity except Sulphur	()
4	The bond in magnesium oxide is single covalent bond	()
5	The bond in oxygen molecule is a triple covalent bond	()
6	The common name of sodium hydroxide is table salt.	()
7	Oxides are substances that dissociate in water producing positive hydrogen ions.	()
8	(CO ₂) is a <u>metal</u> oxide.	()

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☀ (5) Give reason

1.	The bond in water molecule is a single covalent bond.		
2.	Potassium (19K) is monovalent, while oxygen (8O) is divalent.	•••••	•••••
3.	The valency of noble gases is zero.		<u> </u>
4.	Acids turn the color of litmus to red.		
5.	Sodium is monovalent element.		•••••
3	☀ (6) <u>What happen if:</u>	•••••	•••••
	Putting litmus paper in a beaker contains HCl		
2.	An atom loses one electron or more.	••••••	•••••
A. #1		•••••	•••••
	7) Put ($\sqrt{\ }$) or (X): Some elements have more than one valency such as iron (Fe).	()
	Sodium hydroxide changes the colour of litmus paper into red.		
3.	Bromine is a liquid nonmetal.	()
4.	In the positive ions, the number of electrons more than the number of protons.	()
5.	All nonmetals conduct electricity.	()
6.	Both mercury and bromine exist in liquid state.	()
7.	All non-metals are bad conductor of electricity except graphite	()
8.	All non-metals are solid except mercury	()
9.	The bond in oxygen molecule is triple covalent	()
10.	In ionic bond is formed due to attraction between positive and negative ions	()
11.	Sodium hydroxide and lime water are bases but magnesium carbonate is salt	()
12.	Chemical formula of carbonate group is (CO ₃)	()
12	The valency of noble cases is zero		

13. The valency of noble gases is zero.

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*****(8) <u>Problems</u>:

Write the electronic configuration of the atoms of the following elemen ($_{18}{\rm Ar}$ - $_{12}{\rm Mg}$ - $_{16}{\rm S}$), then indicate :	nts
1. The type of each atom (metal - nonmetal - noble).	
2. The type of each ion (positive - negative - has no ions).	
	•••••
Write the electronic configuration and valency for the following element	s:
1. $^{27}_{13}$ Al 2. $^{20}_{10}$ Ne 3. $^{24}_{12}$ Mg	
· · · · · · · · · · · · · · · · · · ·	

Model Answer

* (1) Write the scientific term:

- 1. Metals
- 2. Salts
- 3. Bromine
- 4. Valency
- 5. Acids **6.** Triple covalent bond
- 7. Atomic group
- 8. Oxides
- 9. Bases

- **10.** Oxides
- 11. Non-metals

*(2) Choose the right answer:

1. B **2.** B

3. B

- **4.** C **5.** C
- 7. A
- 8. D 9. D
- **10.** C 11. A
 - **13.** A 14. B
- 12. B 15. A

*****(3) Complete the following:

- 1. Red blue
- 2. Single covalent triple covalent
- 3. Hydroxide bicarbonate
- 4. Covalent ionic
- 5. Hydrochloric acid sodium hydroxide
- 6. $H_2O NaC1$
- 7. Mercury bromine
- 8. Ionic single covalent bond
- 9. Trivalent divalent
- **10.** Lose positive ion
- **11.** 7 negative

*****(4) Correct the underlined words:

1. Base 2. NaCl

- 3. Graphite
- 4. Ionic bond
- 5. Double
- **6.** Chloride
- Acids
- Non-metal

☀(5) Give reason for:

- 1. Because oxygen atom shares with two electrons, while each hydrogen atom shares with one electron only.
- 2. Because during chemical reactions, potassium atom loses one electron, while oxygen gains or shares with two electrons to complete their outermost shell.
- 3. Because their outermost energy levels are completely filled with electrons so they don't lose, gain or share with any electrons.
- **4.** Because acids when dissolved in water produce positive hydrogen ions H+
- 5. Because during chemical reactions, it loses one electron

*(6) What happen if:

- 1. It will change into red
- 2. It will change to positive ion

(7) Put ($\sqrt{}$ or (X)

- (X)
- $(\sqrt{})$ 8. (X)

(X)

2

13. $(\sqrt{\ })$

(\checkmark) (8) Problems

1	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
	1. Noble gas 2. has no ions
	$\frac{Mg}{12}$ $\stackrel{L}{\underset{2}{\bigvee}}$ $\stackrel{M}{\underset{2}{\bigvee}}$
	1. Metal element 2. Positive ion
	$_{16}$ S $\left(\begin{array}{c} \mathrm{K} \\ \mathrm{N} \\ \mathrm{N} \end{array}\right)$ $\left(\begin{array}{c} \mathrm{M} \\ \mathrm{A} \end{array}\right)$
	1. Nonmetal element 2. Negative ion

- Trivalent. Zero.

- Divalent.



تقدم مجاناً من قناة Mr Science على اليوتيوب 101013666614 تابع القناة لتحصل على المزيد من الشرح والاوراق Unit 1

Chemical Combination

metals	Non-metals		
They are elements which have less than (4) electrons in the outermost energy level.	They are elements which have more than (4) electrons in the outermost energy level		
Solids - except (Mercury "Hg" is liquid).	Solids – gases – except (Bromine "Br" is liquid).		
They have metallic luster	They have no luster		
They are malleable and ductile	They are not malleable or ductile		
They are good conductors of heat and electricity	They are bad conductors of heat and electricity – Except (Graphite "Carbon" is good conductor of electricity		

Types of ions

Positive ion	negative ion
It is an atom of metallic element that loses an electron or more during chemical reaction.	It is an atom of nonmetallic element that gains an electron or more during chemical reaction.
It carries positive charges equal to the number of the lost electrons.	It carries negative charges equal to the number of the gained electrons.
The number of its electrons is less than the number of protons inside the nucleus.	The number of its electrons is more than the number of protons inside the nucleus.
The number of energy levels is less than that of its atom.	The number of energy levels is equal to that of its atom.



Types of bonds:

lonic bond	Covalent bond
It is a bond resulting from the electric attraction between a positive ion and a negative ion.	It is a bond occurred among the atoms of non-metals through the participation of each atom with the same number of electrons to complete the outer electron shell of each atom

Types of covalent bond:

- **1-Single covalent bond:** It is the bond which arises between two nonmetal atoms, where each atom shares the other atom with one electron.
- **2-Double covalent bond:** It is the bond which arises between two nonmetal atoms, where each atom shares the other atom with two electrons.
- **3-Triple covalent bond:** It is the bond which arises between two nonmetal atoms, where each atom shares the other atom with three electrons.

lonic bond	Covalent bond
- Formed due to: Electrical attraction between two different elements one is metal "positive ion and another one is nonmetal "negative ion") to form compound.	-Formed due to: sharing of one pair of electrons or more between: two similar nonmetal atoms to form molecule. two different nonmetal atoms to form compound.

Lesson (2) Chemical Combination

<u>Valency</u>: It is the number of electrons that atom loses, gains or shares during a chemical reaction.

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II. Science	Valency of Metals	i
Monovalent Divalent		Trivalent
- Lithium (Li) - Sodium (Na) - Potassium (K) - Silver (Ag)	- Mercury (Hg) - Magnesium (Mg) - Calcium (Ca) - Lead (Pb)	- Aluminum (Al) - Gold (Au)

- Copper (Cu): Monovalent - Divalent - Iron (Fe): - Divalent (Ferrous) - Trivalent (Ferric)

	Valency of Nonmetal	s	
Monovalent	Divalent	Trivalent	Tetravalent
- Hydrogen (H) - Chlorine (CI) - Bromine (Br) - Iodine (I) - Fluorine (F)	- Oxygen (O)	- Nitrogen (N) - Phosphorus (P)	- Carbon (C)

- Sulpher (S): Divalent – Tetravalent – Hexavalent

- Nitrogen (N) - Phosphorus (P): Trivalent

Atomic groups: set of atoms (of different elements) joined together behave like (1) atom during chemical reaction.

Mor	novalent	Divalent	Trivalent
- Hydroxide - Nitrate - Nitrite - Ammonium - Bicarbonate	(OH) (NO ₃) (NO ₂) (NH ₄) (HCO ₃)	- Carbonate (CO ₃) - Sulphate (SO ₄)	- Phosphate (PO ₄)

Chemical formula: It is a formula that represents the number and types of the atoms in a molecule.

Compound	Chemical formula	Compound	Chemical formula	Compound	Chemical formula
Sodium Chloride	NaCl	Aluminium Sulphate	Al ₂ (SO ₄) ₃	Magnesium Hydroxide	Mg(OH) ₂

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Sodium Nitrate	NaNO ₃	Aluminium Carbonate	Al ₂ (CO ₃) ₃	Magnesium Sulphate	MgSO ₄
Sodium sulphate	Na ₂ SO ₄	Aluminum Oxide	Al ₂ O ₃	Hydrogen Chloride	HCI
Sodium Hydroxide	NaOH	Water	H ₂ O	Calcium Carbonate	CaCO₃
Sodium Carbonate	Na ₂ CO ₃	Copper Carbonate	CuCO ₃	Calcium Sulphate	CaSO ₄
Sodium Oxide	Na ₂ O	Carbon Dioxide	CO ₂	Calcium Oxide	CaO

Compare between acids and bases

Acids	Bases		
They are substances which dissolve in water producing positive hydrogen ions (H) ⁺ .	They are substances which dissolve in water producing negative hydroxide ions (OH) ⁻ .		
The symbol of acids begins with H.	The symbol of alkalis ends with OH.		
They have sour taste.	They have bitter taste.		
They change color of litmus paper into red: Due to presence of hydrogen ions (H) ⁺ .	They change color of litmus paper into blue: Due to presence of hydroxide ions (OH) ⁻ .		
Ex: Hydrochloric acid (HCI) – Sulphoric acid (H ₂ SO ₄)	Ex: Sodium Hydroxide (NaOH) -		



Types of Compounds:

Oxides: They are compounds resulted from combination between oxygen and element which is metal or non-metal.

Metal oxides	Non-metal oxide
Formed from combination of oxygen with metal.	Formed from combination of oxygen with nonmetal.
Sodium oxide (Na ₂ O) - Calcium Oxide (CaO) - (Al ₂ O ₃).	Carbon dioxide (CO ₂) – Sulpher trioxide (SO ₃).

Salts:

Compounds resulted from combination of positive ion (or atomic group) with negative atomic group (or ion except (O2).

Mineral salts:

Salts dissolved (soluble) in water		Salts undi (insoluble)	
Sodium chloride (NaCl)	Sodium sulphide (Na ₂ S)	Silver chloride	(AgCI)
Potassium sulphate (K ₂ SO ₄)	Calcium nitrate [Ca(NO ₃) ₂]	Lead iodide	(Pbl ₂)
Magnesium carbonate (Mg	CO ₃)	Lead sulphate	(PbSO ₄)



February Revision 2024

1) Complete:

1-The bond in sodium chloride molecule (table salt) isWhereas in
water molecule is
2-On dissolving acid in water, it gives Positive ions, while alkali gives
negative ions
3 Elements classified into, and
4 The valency of ₁₃ Al is, while that of ₂₀ Ca is
5 During chemical reaction, sodium atom tend to one electron and
changes into
6 The bond in nitrogen molecule iswhile that of magnesium oxide is
7 The bond in oxygen molecule is while that of calcium oxide is
8- Acids change the color of litmus paper into due to the presence of
9- The outer level in 17Cl haselectron(s), so it form ion. Its
bond is bond
10 is one of acids has oxygen, while is one acids hasn't oxygen.
11- The valency of sulphate group iswhile that of hydroxide group is
12 is a liquid metal, but is a liquid non-metal.
13- Nitrogen atom haselectrons, while nitrogen ion has electrons
14- Acids have taste, while base has taste
15- The valency of $_{20}$ Ca is, while that of $_{17}$ Cl isand that of noble
gas ₁₈ Ar is
2) Put ($$) or (x) and correct the wrong ones:
1- All non-metals are bad conductor of electricity except graphite (
2- Lithium ion has one positive charge ()

Mr.Science	ى المزيد من الشرح والاوراق	ا تابع القثاة لتحصل عا	01013666614	ماعى اليوتي وب الموتيوب	ندم مجانباً من قناة Mr Science	ii.
3- All non-metals a	are solid excep	t mercury	()		
4- The bond in oxy	/gen molecule i	s triple cov	alent ()		
5- In ionic bond is	formed due to	attraction b	etween p	ositive	and negative	ions
6- Water molecule	consists of 2 a	toms of two	element	ts ()	
7- The chemical fo	ormula of nitric	acid is HNC)3	(
3) Choose	<u>the corre</u>	<u>ct ansv</u>	ver:			
1- The number of	known element	s till now is		••		
a. 118	b. 113	c. 92	d	. 20		
2- From solid met	al					
a) Mercury	b. nitrogen	c. magne	sium d	. chlori	ne	
3- The neutral ato	m an	d change to	positive	ion.		
a. Gain electro	ns	b	. Charge	of nucl	eus change	
c. number of er	nergy levels inc	reases. d	. lose ele	ctrons		
4- In positive ion -	the number of	protons	r	number	of electrons.	
a. less than	b. more tha	an	c. equal			
5- The type of bon	ıd in water mole	cule				
a. covalent	b. single c	ovalent	c. doub	le cova	lent	
6- The triple cova	lent bond is for	med in	mc	olecule		
a. Hydrogen	b. Nitroger	n c. C	xygen		d. water	
7- Argon is	valent.					
a. zero	b. mono	c. di	İ		d. Tri	
8- The chemical fo	ormula of carbo	nate is	•••••			
a. Co₃	b. Co	c. H	HCo₃		$d. SO_4$	
9 salt	dissolve in wate	er.				
a. K₂ SO₄	b. Cu CO3	c) P	b SO ₄			
10	is the bon	d in hydrog	en mole	cule		
a. covalent	b. single c	ovalent	c. doub	le cova	lent	



4) Write scientific term:

 The number of electrons gained, lost or even shared 	during a chemic	al
reaction.	()
2- Elements have more than 4 electrons in outer level.	()
3- An atom loses or gains electrons during chemical re	action ()
4 It is the atom which loses an electron or more durin	g chemical react	ion.
)
5- An atom that doesn't give or gain any electrons durir	ng chemical reac	tion.
)
6- The only non-metal that exists in a liquid state.	()
7- An atom that give an electron or more during chemic	al reaction.	
	()
8- Elements which the outermost shells are completely	filled with electr	ons.
	()
9- The bond resulting from the electric attraction betwe	een positive ion (metal)
and negative ion (non- metal).	()
10- A bond resulting from participation (sharing) of eac	h of two atoms w	vith
three electrons.	()
11- The bond that is formed between Magnesium and o	xygen. ()
12- A set of atoms joined together behave like one atom	n during chemica	ıl
reaction and have own valency.	()
13-Compounds dissolved in water producing positive h	ydrogen atom.	
	()
14- Substance that dissolve in water to produce negati	ve hydroxide ion.	
	()
0		



15- Compounds resulted from the comb	oination between oxygen a	nd element.
	()
16- Compounds produced as a result of	f the combination of a posit	ive ion with
negative ion except oxygen	(,

5) Write the chemical formula of the following:

The Compound	Chemical formula	The Compound	Chemical formula
1. Sodium Chloride		13. Sodium Oxide	
2. Sodium nitrate		14. Carbon Dioxide	
3. Sodium Carbonate		15. Hydrogen Chloride.	
4. Sodium Hydroxide (Caustic soda)		16- Sulphur trioxide	
5. Calcium Chloride		17- Sulphuric acid	
6. Calcium Nitrate		18- Nitric acid	
7. Calcium Carbonate		19- Hydrochloric acid	
8. Calcium Sulphate		20-Sulphur dioxide	
9. Calcium Hydroxide	<u> </u>	21- Ferrous oxide	
10. Copper Carbonate		22- Ferric hydroxide	
11. Aluminum Carbona	1 3	23- Water	
12. Aluminum Sulphate	-	24- Ammonium nitrate	

6) Give reason for:

١.
n.
nd.



4-lonic bond produce compounds only not elements, but covalent bonds produce both element and compound.
5- When an atom of chlorine (17CI) is joined with an atom of sodium (11Na) the product will be ionic bond.
6- When two atoms of chlorine are joined together; the product will be covalent bond.
7- The bond in Oxygen molecules is a double covalent bond.
8-The bond in water molecule is a single covalent bond.
9- Potassium (19K) is monovalent, while oxygen (8O) is divalent.
1- Single covalent 2- H - OH 3- Metals - nonmetals - inert gases

4- tri – di 5- lose – positive ion 6- triple covalent – ionic 7- double - ionic 8- red – H⁺ 9- (7) – negative ion – single covalent 10- H2SO4 - HCl 11- divalent - mono valent 12- mercury – bromine 13- 7 – 10 14- sour – bitter 15- divalent – monovalent – zero

(Mr.Science

تقدم مجاناً من قناة Mr Science على اليوتيوب 01013666614 تابع القناة لتحصل على المزيد من الشرح والاوراق

2- √

3-x

4- x

6- x

7-√

3}

1- a

2-C 3- d

4- b

5- b

5-√

6- b

7- a

8-a

9-a

10 -b

4) 1- valency

2- non metals 3- ion 4-positive ion

5- inert gas

6- bromine

7- non metal 8- inert gases

9- ionic bond

10-covalent bond 11- ionic bond 12- atomic group

13-acids

14- bases

15- oxides

16 -salts

The Compound	Chemical formula	The Compound	Chemical formula
1. Sodium Chloride	NaCl	13. Sodium Oxide	Na ₂ O
2. Sodium nitrate	NaNO ₃	14. Carbon Dioxide	CO ₂
3. Sodium Carbonate	Na ₂ CO ₃	15. Hydrogen Chloride.	HCI
4. Sodium Hydroxide (Caustic soda)	NaOH	16- Sulphur trioxide	SO ₃
5. Calcium Chloride	CaCl ₂	17- Sulphuric acid	H ₂ SO ₄
6. Calcium Nitrate	Ca(NO ₃) ₂	18- Nitric acid	HNO ₃
7. Calcium Carbonate	CaCO ₃	19- Hydrochloric acid	HCI
8. Calcium Sulphate	CaSO ₄	20-Sulphur dioxide	SO ₂
9. Calcium Hydroxide	Ca(OH) ₂	21- Ferrous oxide	FeO
10. Copper Carbonate	CuCO ₃	22- Ferric hydroxide	Fe ₂ O ₃
11. Aluminum Carbonate	Al ₂ (CO ₃) ₃	23- Water	H ₂ O
12. Aluminum Sulphate	Al ₂ (SO ₄) ₃	24- Ammonium nitrate	NH ₄ NO ₃

1- Bec. The number of positive protons is more than the number of negative electrons

2- Bec. The number of positive protons is less than the number of negative electrons.

3-Bec. Magnesium is metal lose 2 electrons and change into positive ion while oxygen is non metal gain 2 electrons and change into negative ion .



- 4-bec. Ionic bond occurs between two different elements one metal and the other one non metal while covalent bond occurs between two nonmetals
- 5- Bec. sodium is metal lose 1 electron and change into positive ion while chlorine is non metal gain 1 electron1 and change into negative ion
- 6- Bec. Both of atoms are nonmetals each one share with one electron
- 7- Bec. Each oxygen atom share with two electrons
- 8- Bec. Each oxygen atom share with one electron
- 9- Bec. Potassium atom tend to lose one electron in the outer most energy level
 While oxygen tend to gain two electrons in the outer most energy level

First: Metals and Nonmetals

I - Compare between each of the following :

1 - Metals and nonmetals

P.O.C	Metals	Nonmetals
Definition		
Physical state		
Luster		
Malleability and ductility		
Electric and heat conductivity		
Number of electrons in the outermost energy level		
Behaviour of their atoms during the chemical reactions		
Examples		

2 - Write the scientific term for each of the following:

- 1 Elements have luster, good conductors of heat and electricity, malleable and ductile and they have 1, 2 or3 electrons in their outer electron shells
- 2 The only metal that exists in a liquid state
- 3 They are solids and gases, not lusters, bad conductor of heat and electricity, brittle and containing 5, 6 or 7 electrons in their outer shell
- 4 The **only nonmetal** that exists in **a liquid** state

5 - The only nonmetal that conducts electricity
6 - A non-metallic element although it contains one electron in its outer shell
3 - Complete the following statements :
1 – The number of known elements up till now iselements
2 - Elements are classified according to theirandintoandand
3 - Metals have less thanelectrons in the outermost shell
4 - All metals areexceptwhich is a liquid 5 - Metals may be solids asand liquids asand liquids
6elements are good conductors of heat and electricity
7 - Nonmetals havethan 4 electrons in their outermost shell
8 - Nonmetals are solids andexceptwhich is a liquid
9 - Nonmetals may be solids as, liquids asand gases as
10 - All nonmetals areconductors of electricity, exceptwhich is conductor of electricity
4 - Give reason for each of the following :
1 - The electric wires are manufactured from copper ?
2 – Some metals are used in manufacturing of some cooking pots ?
3 - Jewellery is made up of some metallic elements?
5 - What happens when :
1 - You hammer on a piece of carbon? Why?

6 - Put ($$) or (x), then correct the	he false statement :			
1 - All metals are solids except mercury w	hich is a liquid		()	
2 – Bromine is the only liquid metal			()	
3 - Nonmetals exist in three states			()	
4 - Bromine is the only liquid nonmeta	1		()	
5 - Graphite is a metal which is a good of	conductor of electricity		()	
6 - Active gases are gaseous nonmetals			()	
7 - Hydrogen gas is a gaseous nonmetal	1		()	
8 - Hydrogen (1H) is a metal as it has on	e electron in outermost energy level	1,00	()	
9 – Carbon is a solid metal			()	
7 - Choose the correct answer				
1 – The number of known elements up t				_
a. 92	b. 118	C. 121		d. 211
2 – The number ofdetermines	the type of element and its chemical ac	ctivity		
a. electrons in the outer energy levelb. levels filled with electrons		c. neutrons d. protons		
3 – All of the following are from the prope	erties of metals, except	u. protons		
 a. they are malleable and ductile b. they are good conductors of electric c. they contain 1, 2 or 3 electrons in our d. they are bad conductor of heat 	Sept. Cart.			
4 - All of these elements are metal solid e	lements, <i>except</i>			
a. sodium	b. magnesium	c. aluminium		d. mercury

5 – All the following are metals , except			
a. iron	b. oxygen	c. sodium	d. copper
6 - The only metal that exists in a liquid s	state is		
a. bromine	b. mercury	c. oxygen	d. water
7 - What is the liquid element that has a n	netallic luster?		
a. Mercury	b. Bromine	c. Iodine	d. Chlorine
<u>8</u> - The cables of electric wires are made	up of an element, its atomic number is		
a. 10	b. 7	c. 13	d. 17
9 - The element which has atomic numbe	er 12 is considered from		
a. metals	b. nonmetals	c. nobel gases	d. acids
10 - All of the following are from the prope	erties of nonmetals, except		
a. they aren't malleable and ductileb. they aren't good conductors of electricc. they contains 1, 2 or 3 electrons in our		d. they are bad conductor of heat	
11 – Hydrogen , oxygen and carbon are fro	om	·····	
a. acids	b. bases	c. metal	d. nonmetals
12 - The only nonmetal that exists in a liq	uid state is		
a. bromine	b. mercury	c. oxygen	d. water
13 - All of nonmetals don't conduct electric	city, except		
a. bromine	b. aluminium	c. graphite	d. mercury
14 - All the following materials are good co	onductors of electricity , except		
a. copper	b. aluminium	c. carbon	d. sulphur

8 - Choose the odd word	out – write the scientific ter	n:		
1 - Magnesium - Sodium - Mercury	– Aluminum	()	
The scientific term for others :				
2 – Bromine – Carbon – Sulphur – F	Phosphorus	()	
The scientific term for others :				
3 - Hydrogen - Oxygen - Nitrogen	– Graphite	(.)	
The scientific term for others :				
4 - Silver - Potassium - Oxygen - C	alcium	(.)	
The scientific term for others :				
$5 - {}_{17}Cl - {}_{20}Ca - {}_{19}K - {}_{11}Na$		(
The scientific term for others :				
$6 - {}_{9}F - {}_{16}S - {}_{5}B - {}_{15}P$		()	
The scientific term for others :				
$7 - {}_{12}Mg - {}_{11}Na - {}_{4}Be - {}_{20}Ca$	200	()	
The scientific term for others :				
9 – Mention one difference	between:			
1 – Graphite and oxygen		2 - O ₂ a	nd 2O	
Graphite	Oxygen		O_2	20
		\$40,000,000,\$30,000,000		
3 - Mercury and Bromine				<u>i</u>
	Graphite		(Oxygen

Second:	Positive i	on and M	Vegative	ion
---------	------------	----------	----------	-----

I - Compare between each of the following:

1 - Positive ion and negative ion

P.O.C	Positive ion (Cation)	Negative ion (Anion)
Definition		
Charge		
Number of electrons		
and protons		
Number of energy		
levels		
Examples		

2 - Write the scientific term for each of the following:

- 1 An atom that loses (gives) an electron or more during the chemical reaction
- 2 An atom that gained an electron or more during the chemical reaction

3 - Complete the following statements:

- 1 Atoms of.....tend to lose an electron or more during the chemical reaction and change into.....ions
- 2 An atom that **lost** an electron or more during the chemical reaction is called......
- 3 The **positive ion** carries **a number** of......**charges** that are **equal** to the **number** of.....**electrons**
- 4 **During** the **chemical reaction**, sodium **atom** $\binom{23}{11}Na$) loses (gives).....electron and **changes** into.....ion

5 – The number of electrons in the outermost shell of magnesium $\binom{24}{12}Mg$ atom is, while that of magnesium ion is
6 - Sodium atom (23/Na) containselectrons, while sodium ion containselectrons
7 - The symbol of sodium atom is, while that of sodium ion is
8 - Atoms oftend to gain an electron or more during the chemical reaction and change intoions
9 - An atom that gained an electron or more during the chemical reaction is called
10 – The negative ion carries a number of charges that are equal to the number of electrons
11 - During the chemical reaction, nitrogen atom (14N) gainselectrons and changes intoion
12 – The number of electrons in the outermost shell of $oxygen(^{16}_{8}0)$ atom is, while that of oxygen ion is
13 - Nitrogen atom (14N) contains electrons , while nitrogen ion contains electrons
14 – The symbol of oxygen atom is, while that of oxygen ion is
15 – The number of energy levels in an atom ofelement is equal to the number of energy levels in its ion, while the number of energy levels in an atom ofelement is more than the number of energy levels in its ion
4 - What happens when:
1 – An atom <i>loses</i> one electron or more?
2 – An atom <i>gains</i> one electron or more?
5 - Give reason for each of the following :
1 - When an atom loses (gives) an electron or more, it becomes a positive ion?
2 – Both sodium <i>ion</i> and magnesium <i>ion</i> have the same number of <i>electrons</i> ?
3 – It is impossible to combine sodium and magnesium to form a compound ?

4 – When an atom gains an electron or mo			
5 – Both nitrogen <i>ion</i> and oxygen <i>ion</i> have	the same number of <i>electrons</i> ?		
6 - Choose the correct answer:			
1 - When an atom of an element loses one	electron or more during, it changes into	••	
a. a positive ionb. a negative ion		c. a neutral atom d. (a) and (b)	
2 – All the following elements can form a p	ositive ion, except		
a. ₁₁ Na	b. ₁₇ Cl	c. ₁₂ Mg	d. 19K
3 - In a positive ion, the number of proto	ns inthe number of electrons		
a. more than	b. less than	c. equal to	d. double
4 – Which of the following is the electronic	structure of sodium <i>ion</i> ? Fig. ()		
$ \begin{pmatrix} +10 \\ \pm 12 \end{pmatrix} $ a. 2	$ \begin{pmatrix} L & \begin{pmatrix} 11 \\ \pm 12 \end{pmatrix} & \begin{pmatrix} K \\ \pm 12 \end{pmatrix} & \begin{pmatrix} M \\ \pm 12 \end{pmatrix} & \begin{pmatrix} K \\ \pm 12 $	$ \begin{array}{ccc} K & L & K & L \\ \downarrow 11 & & \downarrow 12 \\ \downarrow 2 & 8 & & d. & 2 & 8 \end{array} $	
5 – Number of energy levels in sodium ion	isnumber of energy level of its	atom	
a. more than	b. less than	c. equal to	d. half
6 – A lithium atom (Li) changes into a lithi	um ion (Li ⁺), which mean that it		
a. gains one proton b. loses one proton		c. gains one electron d. loses one electron	
7 – During the chemical reaction, a magne	27		
a. Mg ⁺	b. Mg ⁻	c. Mg ⁺²	d. Mg ⁻²

8 – An element (X), its atomic n	umber is 12, so the number of electro	ons in its ion is	
a. 10	b. 15	c. 17	d. 18
9 - The difference between sodiu	m atom (₁₁ Na) and sodium ion (Na+) i	s the number of	
a. protons	b. electrons	c. energy levels	d. (b) and (c)
10 - The number of electrons in	the <i>ion</i> of sodium (Na+) is		
a. 1	b. 8	C. 2	d. 10
11 – The number of electrons in the	e outer level (shell) of 13Al ⁺³ is		
a. 8	b. 13	C. 10	d. 3
12 – Each of the following sentence	es is true about aluminium element (
c. number of energy level in its d. number of electrons in its io	ucleus is greater than the number of pr	atom	
a. a positive ion	b. a negative ion	c. a neutral atom	d. (a) and (b)
14 - All the following elements car	n form a negative ion, except		
a. ₇ N	b. 8O	c. ₁₆ S	d. 20Ca
15 - In a negative ion, the numbe	er of electrons inthe numbe	r of protons	
a. more than	b. less than	c. equal to	d. double
16 - Which of the following is the	electronic structure of chloride <i>ion</i> ? Fi	g. () K L M K L	
а	$(\bullet 1)$ $(\bullet 1$	$\begin{pmatrix} & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & & \\ & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & $	

17 – Number of energy levels in chloride i o	on isnumber of energy level of its	atom	
a. more than	b. less than	c. equal to	d. double
18 – An oxygen atom (O) changes into an ox	xygen ion (O ⁻²), which mean that it	••	
a. gains 2 protons	b. loses 1 proton	c. gains 2 electrons	d. loses 3 electrons
19 – During the chemical reaction, oxygen a	tom (8O) gains 2 electrons and changes to	D	
a. O ⁺	b. O	c. O ⁺²	d. O ⁻²
20 – When a nitrogen atom $\binom{14}{7}$ gains elec	trons to complete its outer shell, it becom	es	
a. N ⁺³	b. N ⁻²	c. N ⁻³	d. N
21 - The number of electrons in the ion of	oxygen (O ⁻²) is	70 a	
a. 1	b. 8	c. 2	d. 10
22 – The number of electrons in the outer	· level (shell) of 7N ⁻³ is		
a. 8	a. 13	b. 10	c. 3
23 - An element (Y), its atomic number is	17, so electronic configuration of its ion i	S	
a. 2,8,7	b. 2,8,8	c. 2,8,8,7	d. 2,8,1
24 - The difference between chlorine aton	n (17Cl) and chloride ion (Cl-) is number of	f	
a. electrons	b. protons	c. energy levels	d. (a) and (c)
25 – Which of the following is negatively c	harged and its outermost energy level i	is completely filled with electrons?	
a. Neon atom	b. Ammonium group	c. Sulphide ion	d. Chlorine atom
7 - Put (√) or (x), then correct the	e false statement :		
1 – Sodium, magnesium and aluminium o	can form positive ions	()	

2 – In positive ion, the number of electron	ns is greater than that of protons	()			
3 - The number of energy levels in the po s	The number of energy levels in the positive ion is more than that of its atom				
4 - Oxygen, nitrogen and chlorine can for	- Oxygen, nitrogen and chlorine can form negative ions				
5 - In negative ions, the number of proton	s is less than that of electrons	()			
6 – The number of energy levels in the ne	gative ion is equal to that of its atom	()			
8 – Study the following figures, th	nen answer :				
$\frac{1}{2}$ – From the two opposite figures : The char			(±3)		
a2 b1	c. +1 d. +2	0 000			
≥ - The following figures represent the electroneergy levels Element (S)	Element	lement	Element (P)	ments, its electrons re	volve in three
a. What are the elements that are consi	dered from metals ?				
b. What is the element which forms an	**				
c. What is the type of the ion which the	element (R) forms? (Give reason)				
d. What is the element , whose nucleus	contains 11 protons? (Give reason)				
					•••••

Third: Nobel (inert) gases
I – Write the definition each of the following :
1 - Nobel (inert) gases :
2 – Write the scientific term for each of the following :
1 - Elements whose outermost shells are completely filled with electrons
2 - An atom of an element that <i>doesn't</i> lose or gain any electrons
2 – An atom of an element that <i>doesn't</i> lose or gain any electrons 3 – The only inert gas that has 2 electrons in its outermost energy level
3 – Complete the following statements :
1 - An atom of doesn't lose or gain any electrons under ordinary conditions
2andare examples of inert gases
3 - All of nobel gases containelectrons in their outermost energy level, exceptwhich haselectrons in its energy level
4 - Give reason for each of the following :
1 - Nobel gases (as argon) can't form either positive or negative ions?
P. Characally annual manager

5 - Choose the correct answer :

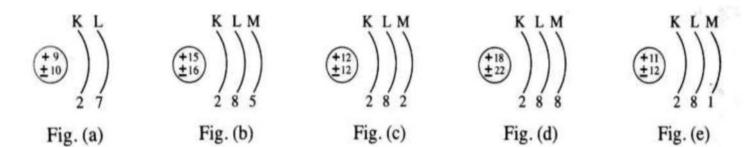
- 1 **All** the following are from **properties** of **inert gases**, *except*.....
 - a. they don't participate in chemical reactions
 - b. their outermost shells are completely filled with electrons
 - c. they form negative ions
 - d. their molecules consist of one single atom

2 – All of these elements can part	icipate in chemical reactions, except		
a. _n Na	b. 10Ne	c. ₁ H	d. ₇ N
3 - The molecules of inert gases	consist of		
a. two different atoms		c. two similar ato	ns
b. one atom		d. one or two simi	lar atoms
6 - Put ($$) or (x), then cor	rect the false statement :		
1 - Nobel gases can't form either J	positive or negative ions	()	
2 - Nobel gases lose electrons an	nd change into positive ions	()	
3 - The molecules of nobel gase	s are diatomic (consist of two atoms)	(
	Fourth: The	atom and The ion	
I – Compare between eac	ch of the following :		
1 - The atom and the ion			
P.O.C	The atom		The ion
Electric charge			
Number of electrons		25-05-05-05-05-05-05-05-05-05-05-05-05-05	
Number of electrons in the			
outermost energy level			
2 - Write the definition ed	ach of the following :		
1 - The ion :			
- 110 1011			

3 - Write the scientific te	erm for each of the following	ng:	
1 – An atom that loses (gives) or	gains an electron or more during cl	hemical reaction	
4 - Complete the following	ng statements :		
1 – The atom isin	its ordinary state, while the ion may	becharged	
5 - Give reason for each	of the following :		
1 – The number of electrons of	an ion differs from that of its atom?	?	
2 – Sodium atom ("Na) tends to	form a positive ion, while oxygen a	atom (8O) tends to form a negative ion?	
3 – Both sodium <i>ion</i> and oxygen	ion have the same number of electr	ons?	
4 – Both sulphur and calcium <i>ior</i>	ns have same number of energy leve	els? (32S - 40Ca)?	
6 - Choose the correct o	nswer:		
1 - When an atom is changed in	to an ion , theis changed	I	
a. number of protonsb. number of electrons		c. number of neutrons d. mass number	
<u>a</u> − The number of electrons in	the outermost energy level of oxyg	gen <i>ion</i> equals the number of electrons in the	e outermost energy level of
a. ₂₀ ⁴⁰ Ca <i>ion</i>	b. ₇ ¹⁴ N <i>atom</i>	c. ₁₇ 35Cl <i>atom</i>	d. ₁₆ 32S <i>atom</i>

3 - The electronic configuration of potassium (19K) ion is similar to the electronic configuration ofion							
a. 8O	b. 11Na c. 18Ar d. 17Cl						
4 − A nonmetal , its nucleus contains 18 neutrons , its electrons orbit in 3 energy levels and it tends to gain 1 electron during the chemical reactions, its <i>mass no.</i> is							
a. 17	b. 18 c. 35 d. 40						
5 - There is an equal num l	oer of electrons in the ions of						
 a. chloride Cl⁻ and potas b. chloride Cl⁻ and sodiu 			c. oxide O ⁻² and calcium 0 d. oxide O ⁻² and sulphide				
6 - What is the similarity b	petween metals and nonmetals? .		1000				
b. Tend to gain electronsc. The outermost energy	 a. Malleable and ductile b. Tend to gain electrons in chemical reactions c. The outermost energy levels in their atoms is not completely filled with electrons d. Do not have metallic luster 						
7 - Four elements (X), (Y),	(Z) and (W), their atomic numbe	rs are 1, 10, 17 and 19.					
Which two elements w	hose the molecule of each of ther	n is composed of two a	toms?.				
a. (X) and (Z) b. (Z) and (W) c. (X) and (W) d. (X) and (Y)					l. (X) and (Y)		
7 – Study the followin	ng figures, then answer :						
1 – Which of the following fi	1 – Which of the following figures represents :						
1. A neutral nonmetal	l element	()	(+8)	(+11)	(+7)))	(+10)	
2. A nobel gas		()	2 8	2 8	$\bigcup_{2} \int_{5}$	$\bigcup_{\substack{j\\2}}$	
3. A negative ion		()	Fig. (a)	Fig. (b)	Fig. (c)	Fig. (d)	
4. A positive ion		()					

2 – The following figures represent some *atoms*, answer the following questions



a. Find the kind of element and ion if present

b. Find the **number** of **electrons** lost or gained during the chemical reaction

c. Which of these atoms is **a good** conductor of **heat** and **electricity**

8 - Complete the following table :

Element	17,000			onic tion	Its type	Type of ion		Elect ofiguo the			Symbol of the ion
	K	L	M	N			K	L	M	N	
²³ ₁₁ Na			4								
35 17 Cl				7							
40 18 Ar											
⁴ ₂ He											
1 ₁ H											
12 ₆ C											

9 – Me	ention one differe	ence between :		
1 – Na a	and Na ⁺			
		Na	Na ⁺	
10 – Ar	nswer the followi	ng question :		
Mention	n the atomic number	and the type of element with drawing a dia g	gram showing the electronic configurati	on for each atom of the following :
1. A	n element atom that	gains two electrons in the outermost energ	y level (L) during the chemical reaction	
•••				
2. A	n element atom whos	se electrons are distributed in 4 energy level	s and its ion carries one positive charge	
			,	
•••				
3. A	n element atom whos	se electrons distribute in 3 energy levels and	the symbol of its ion is (X ⁻³)	
•••				
4. A	n element atom that l	loses two electrons during the chemical reac	tion, so (M) becomes the outermost energ	v level of its ion
1000				
•••				
•••				

Fifth: Ionic bond and covalent bond

I - Compare between each of the following :

1 - Ionic bond and covalent bond

P.O.C	Ionic bond	Covalent bond
	3	
Definition		
Type of elements		
Way of formation		P
5		
Its types		
W 42		
Type of the		
produced molecules		

2 – Write the scientific term for each of the following :

- 1 A bond results from electric attraction between a positive and a negative ions
- 2 A bond that is formed between **sodium** and **chlorine** atoms
- 3 A bond that is formed between **magnesium** and **oxygen** atoms
- 4 A bond that is formed between **two nonmetal elements** with **sharing** of **electrons**
- 5 A bond resulting from the **participation** of each of the **two atoms** with **electrons**
- 6 A bond resulting from the **participation** of each of the **two atoms** with 1 electron
- 7 A bond results from *two hydrogen atoms*, where each atom shares with 1 electron

8 - A bond resulting from the participation of each of the two atoms with 2 electrons
9 - A bond arises between <i>two oxygen atoms</i> , where each atom shares with 2 electrons
10 - A bond resulting from the participation of each of the two atoms with 3 electrons
11 – A bond results from <i>two nitrogen atoms</i> , where each atom shares with 3 electrons
12 – The bond that is found between the atoms of a water molecule
3 - Complete the following statements :
1 – During the formation of sodium chloride molecule, 17Cl atomone electron and changes intoion
2 – During the formation of MgO molecule,atom loseselectrons which are gained byatom
3andare examples of <i>ionic compounds</i>
4 - Covalent bonds are formed among twoelements
5 - Inbond, the atoms don't lose or gain any electrons
6 - In single covalent bond, each atomwithelectron such as inandmolecules
7 - In double covalent bond, each atomwithelectrons such as inmolecule
8 - In triple covalent bond, each atomwithelectrons such as inmolecule
9is an example of covalent compounds
10 - The bond in sodium chloride isbond, whereas in water molecule isbond
11 - Magnesium oxide hasbond, while oxygen molecule hasbond
12 - Oxygen atomtwo electrons on the formation of magnesium oxide molecule, while ittwo electrons during the formation of oxygen molecule
4 - Give reason for each of the following :
1 – The bond in sodium chloride (NaCl) molecule is an ionic bond?

2 - The bond in magnesium oxide (MgO) molecule is an ionic bond?
3 – The bond in hydrogen (₁ H) molecule is <i>a single</i> covalent bond?
4 – The bond in oxygen (8O) molecule is <i>a double</i> covalent bond?
5 – The bond in nitrogen (7N) molecule is a triple covalent bond?
6 - The bond in water molecule (H ₂ O) is a single covalent (coordinate) bond?
7 - When an atom of chlorine (17Cl) is joined with an atom of sodium (11Na), the product will be an ionic compound , but when two atoms of chlorine are joined together, the product will be a covalent compound ?
8 – Ionic bonds produce compounds only not elements, but the covalent bonds produce both types an element or even a compound?
5 - What happens when :
1 – Chlorine atom combines with sodium atom?
2 - An electric attraction occurs between sodium ion and chloride ion?
3 - Oxygen atom combines with magnesium atom?
4 - An electric attraction occurs between magnesium ion and oxygen ion?
5 - Two oxygen atoms combine together?

6 - A chlorine atom combines with a hydrogen atom?	
6 - Put ($$) or (x), then correct the false statement :	
1 – Ionic bond arises between two nonmetals	()
2 - In an ionic bond, the metal atom gives electrons to the nonmetal atom	()
3 - The bond in sodium chloride molecule is a single covalent bond	()
4 - Table salt is an ionic compound	()
5 - Magnesium oxide is an ionic compound	()
6 – During the formation of magnesium oxide molecule, a magnesium atom gains tw	vo electrons from oxygen atom ()
7 - In covalent bond, the two nonmetal atoms do not lose or gain electrons	()
8 – The bond in hydrogen molecule is a single covalent bond	()
9 - The bond in water molecule is a covalent bond	()
10 – The bond in oxygen molecule is double ionic bond	()
11 – Each atom in oxygen molecule shares with two electrons	()
12 - The bond in a nitrogen molecule is a triple covalent bond	()
7 - Choose the correct answer:	
1 - The ionic bond usually arises (originates) between elements	
a. two metallic b. two nonmetallic	c. metallic and nobel d. metallic and nonmetallic
2 – The bond in sodium chloride and magnesium oxide molecules arebond	
	c. double covalent d. triple covalent

3 - All the following are ionic compounds	, except					
a. NaCl	b. MgO	c. KCl	d. NH ₃			
4 – During the formation of sodium chlo	ride molecule, sodium atom	L				
a. gains 1 electron from chlorine atom		b. gives 1 electron to chlorine at	tom			
c. gains 2 electrons from chlorine atom		d. gives 2 electrons to chlorine	atom			
5 - During the formation of magnesium of	oxide molecule, oxygen aton	n changes into				
a. positive ion and carries one positive	charge	c. positive ion an carries two p	oositive charges			
b. negative ion and carries one negative	e charge	d. negative ion and carries two	o negative charges			
$\underline{6}$ – The element whose atomic number	isforms an ionic bo r	nd with oxygen				
a. 2	b. 10	c. 12	d. 16			
7 - The covalent bond usually arises (orig	ginates) between ele	ments				
a. two metallic		c. metallic and nobel				
b. two nonmetallic		d. metallic and nonmetallic				
8 – All the following are covalent compo	ınds, except					
a. H₂O	b. H ₂	c. KCl	d. NH ₃			
9 - All the following are examples of sing !	e covalent bonds, except					
a. HCl	b. N ₂	c. H ₂ O	d. H ₂			
10 - Which of the following figures represents the water molecule? Fig ()						
	+(0)	(0))			
	H H O	(H)	(*(H))			

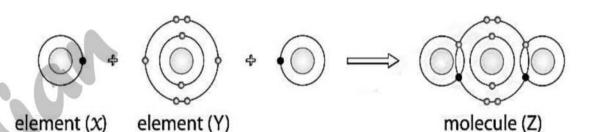
11 - Which of the following sentences is **true** about **bonding** in **water** molecule?.....

- a. Covalent bond due to transfer electrons from (H) atom to (O) atom
- b. Ionic bond due to transfer of electrons from (O) atom to (H) atom
- c. Single covalent bond between (O) atom and each (H) atom
- d. Ionic bond between (O) atom and (H) atoms

12 - The diagram shows the combination of **two atoms** of element (X) and **an atom** of element (Y) to form the **molecule** (Z)

- Which of the following is **correct?.....**

	Number of protons in atom (X)	Atomic number of element (Y)	Type of bond in molecule (Z)
a	1	8	Covalent
b	2	8	Covalent
С	1	10	Ionic
d	2	8	Ionic



13 - The covalent bond in an oxygen molecule is a.....bond

a. single

b. double

c. triple

d. (a) and(b)

14 -is the symbol of *two* oxygen *molecules*

a. O₂

b. 2O₂

c. 2O

d. O

15 - There is a triple covalent bond in.....molecule

a. hydrogen

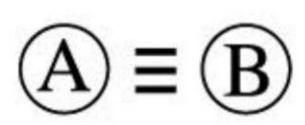
b. chlorine

c. oxygen

d. nitrogen

16 - The opposite diagram shows the **chemical bond** between two atoms (A) and (B). What are the **two atoms?**

	Atom (A)	Atom (B)
a	N	H
b	О	O
С	N	N
d	Н	0



17 - Oxygen and nitrogen molecules are different in	
a. number of atoms in the molecule	c. state of element
b. number of electrons shared by each atom	d. type of bond between atoms
8 – Choose the odd word out – write the scientific term :	
1 – Nitrogen molecule – Table salt molecule – Hydrogen molecule – Oxygen molecule	()
The scientific term for others :	
9 – Answer the following questions :	
1 – Two elements $^{23}_{11}A$ and $^{35}_{17}B$: Mention:	
a. The type of each element	
b. The electronic configuration for each of them?	
c. The type of the bond formed between them? (Give reason) (show by drawing)	
2 – Two elements (8A) and (12B)	
a. Which one is metal and which is nonmetal?	
b. What is the kind of bond formed between them? (Show by drawing)	
c. What is the type of formed compound?	

3 - Two elements (X) and (Y) have atomic numbers (11 and 17) respectively
a. Show by drawing the chemical bond is formed between themb. What is the type of this bond?c. What is the kind of each element?
4 - Draw a diagram showing the electronic configuration of the atom of oxygen (8 ¹⁶ O) Then show how two of its atoms are bonded to form oxygen molecule (O ₂)
Then show how two of its atoms are bonaca to form oxygen morecare (O2)
5 - A, B, C and D are four elements, whose atomic numbers are (1, 11, 10 and 17) respectively
 a. Classify them into metal, nonmetal and nobel gas b. Show by drawing how two atoms of (A) form a covalent bond? c. What is the type of bond when (B) combines with (D)?
d. What is the type of bond when two atoms of (D) combine together?
e. Explain why element (C) doesn't undergo chemical reactions under normal conditions?

10 - Study the following figures, then answer :

1 – The following figures represent **three molecules**, whose **atoms** combine together by **covalent bonds**





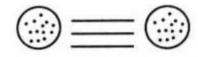


Fig. (a)

Fig. (b)

Fig. (c)

Which of the following figures represents:

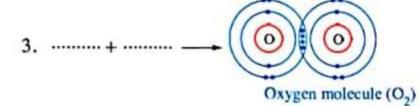
1. Hydrogen molecule (.....)

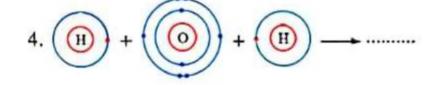
2. Oxygen molecule (.....)

3. **Nitrogen** molecule (.....)

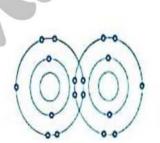
- **2 Complete** the following figures, then write the *kind* of the *bond* :
 - 1.+ Chlorine molecule (Cl₂)

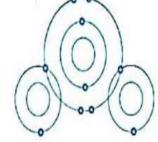


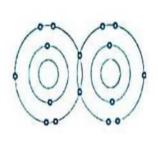


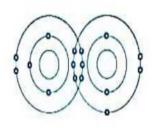


3 – **Copy** the following figures in your answer paper after **correcting** the **mistakes**:









Fluorine molecule F2

Water molecule H₂O

Oxygen molecule O2

Nitrogen molecule N₂

First: Valency		
I – Write the definition of each of the following :		
1 - Valency :		
2 - Write the scientific term for each	of the following	j :
1 - Elements their valencies are zero		
2 - The number of electrons that are gained, los	st or even shared by a	an atom during the chemical reactions
3 – Mention an example for each of th	ne following :	
1 - A monovalent metallic element	()	7 - A trivalent nonmetallic element ()
2 – A divalent metallic element	()	8 - A tetravalent nonmetallic element ()
3 - A trivalent metallic element	()	9 - A pentavalent nonmetallic element ()
4 – A metallic element has more than one valer	icy ()	10 – A hexavalent nonmetallic element ()
5 - A monovalent nonmetallic element	(11 - A nonmetallic element has more than one valency ()
6 - A divalent nonmetallic element	()	
4 - Choose the odd word - write the	scientific term :	:
1 – Lithium – Silver – Sodium – Aluminium	() ()
2 – Oxygen – Iodine – Chlorine – Hydrogen	() ()
3 - Bromine - Chlorine - Iodine - Potassium () ()		
4 - Calcium - Magnesium - Lead - Oxygen () (
5 - Phosphorus - Nitrogen - Sulphur - Chlorine () ()		

5 – What is meant by each of the following :
1 - A trivalent metallic element?
2 – Magnesium (12Mg) is a divalent element?
3 - Fe ⁺³ ?
4 – A trivalent nonmetallic element?
5 – Oxygen (8O) is a divalent element?
6 - Complete the following statements :
1elements do not participate in chemical reactions in ordinary conditions and their valency is
2 - The valency of nobel gases isas their outermost energy shell iswith
3 - The valency of metals may beororas their outermost energy levels have 1,2 or 3 electrons
4 - The valency of aluminium is, while that of calcium is
5 - Some metallic elements have more than one valency such asand
6 – The valency of copper may beoror.
7 - The valency of iron may beand is calledorand is called
8 - The valency of iron isin ferrous chloride, while in ferric chloride is
9 - The valency of fluorine and iodine is, while that of oxygen is
10 - The valency of carbon is
11 - Some nonmetallic elements have more than one valency such asand
12 – The valency of sulphur atom may beoror

13 - Phosphorus element has two valencies which areand		
7 - Give reason for each of the following :		
1 – The valency of nobel gases is zero ?		
2 - Magnesium (12Mg) is divalent, while aluminium (13Al) is trivalent?		
3 - Chlorine (17Cl) is a monovalent element, while oxygen (8O) is divalent	one?	
4 - Potassium (19K) is monovalent, while oxygen (8O) is divalent?		
8 - Put ($$) or (x) then correct the false statement :		
1 – Atomic group is the number of electrons lost or gained or even shared by	y an atom during the chemical reaction ()	
2 – The valency of nobel gas is monovalent	()	
3 – An element of atomic number 20, so its valency is divalent	()	
4 - Potassium (19K) is monovalent, while oxygen (8O) is divalent	()	
5 – The symbol of zinc is (Zn) and it is monovalent	()	
6 - The symbol of lead is (Ld) and it is divalent	()	
7 – Iron has more than one valency	()	
9 - Choose the correct answer:		
1 - The valency of argon (18Ar) is		
a. monovalent	c. trivalent	
b. divalent	d. zero	

2 - The valency of helium (2He) is			
a. o	b. 1	C. 2	d. 4
3 - When an atom loses, gains or shares	by one electron, its valency is		
a. monovalent	b. divalent	c. trivalent	d. tetravalent
4 - When a nonmetal gains or shares b	y two electrons, its valency will be		
a. monovalent	b. divalent	c. trivalent	d. tetravalent
5 - All the following elements are mo	novalent, except		
a. hydrogen	b. sodium	c. oxygen	d. chlorine
6 - All the following element are diva	lent, except		
a. ₁₂ Mg	b. ₇ N	c. ₈ O	d. 16S
7 - The valency of ferr ous is			
a. monovalent	b. divalent	c. trivalent	d. tetravalent
8 - All the following are nonmetals ha	we more than one valency, except		
a. copper	b. phosphorus	c. nitrogen	d. sulphur
9 - What is the common property of th	ne elements , fluorine, chlorine, hydrogen a	and carbon?	
a. They are gaseous elements exceptb. They are monovalent metals exceptc. They are diatomic molecules exceptd. They are nonmetal elements except	ot carbon pt chlorine		
10 – Both iron and nitrogen are simila	r in		
a. are solid metalsb. are divalent elements		c. involve in the structure of acidsd. have more than one valency	

Second: Atomic Groups			
I – Write the definition of each o	of the following :		
1 - Atomic group (radical) :			
2 - Mention an example for each	of the following:		
1 – A monovalent atomic group	()	3 - A trivalent atomic group	()
2 – A divalent atomic group	()	4 – A positive atomic group	()
3 – Write the scientific term for	each of the following :		
1 - A set of atoms of different elements	joined together and they behave	e like one atom during the chemical reaction , ha	ving special valency and don't
exist solely			
2 – The only positive atomic group			
3 - The atomic group that has the same e	lements of water molecule		
4 - Complete the following state	ements:		
1are examp	les of monovalent atomic grou	ıps, while andare examples of div	valent atomic groups
2is a trivalent atomic grou	p		
3 - The only positive atomic group is			
4 - The atomic group that has the same of	elements of water molecule is.		
5 - The difference between nitrate grou	o and nitrite group is one	atom	
6 - The valency of carbonate group is	, while that of bicarbonat	e group is	
7 - The symbol of phosphate group is	and its valency is		

8 - The valency of potassium (K) is, while that of sulphate (SO ₄) is			
9 - The symbol of sulphate gr	9 - The symbol of sulphate group isand it is formed of atoms of different elements		
5 - Give reason for eacl	n of the following :		
1 – Both nitrate and carbonate	groups have the same number of a	ntoms, but differ in their valencies?	
2 – Both nitrite and nitrate gro	oups differ in the number of atoms	and having the same valency?	
6 - Put (√) or (x) then co	rrect the false statement		
1 – The atomic group acts as a	compound in the chemical reaction	ons ()	
2 – The chemical formula of c	arbonate group is (HCO ₃)-	()	
3 - Both nitrate and nitrite gro	oups have the same valency	()	
7 - Choose the correct	answer:		
1 - All the following are monov	alent atomic groups, except		
a. phosphate	b. nitrate	c. hydroxide	d. bicarbonate
2 – Which of the following is a	trivalent atomic group?		
a. Hydroxide	b. Sulphate	c. Ammonium	d. Phosphate
3 - The chemical formula (symbol) of carbonate group is			
a. (NO ₃)-	b. (SO ₄)	c. (NH ₄) ⁺	d. (CO ₃)
4 - The nitrate group is a radical (atomic group)			
a. monovalent	b. divalent	c. trivalent	d. tetravalent
5 - All of these atomic groups carry the same charge, except			
a. nitrite	b. nitrite	c. bicarbonate	d. ammonium

$\underline{6}$ – The atomic group that is formed from the same elements of water is				
a. carbonate	b. hydroxide	c. sulphate	d. nitrate	
7 - Nitrate and nitrite groups are	e different in the			
a. types atoms	b. number of atoms	c. valency	d. type of charge	
8 - Phosphate and sulphate gro	ups are similar in the			
a. type of atoms	b. valency	c. number of atoms	d. (b) and (c)	
8 - Choose the odd word	– write the scientific term :			
1 – Ammonium – Phosphate – Car	bonate - Nitrate () ())		
	THird:	Chemical formula		
I – Write the definition of each of the following :				
ı - Chemical formula :				
2 – What is meant by each of the following :				
1 - The chemical formula of sodium chloride molecule is (NaCl)?				
2 – The chemical formula of water molecule is (H ₂ O)?				
3 – Write the scientific te	rm for each of the following :			
1 – A formula represents the num	ber and the types of atoms in the molecul	e		

4 - Write the - chemical formula - for these compounds :				
5 - The chemical formula of sodium bicarbonate is, and it consists of atoms of different elements				
8 – If the formula of aluminium sulphate is Al ₂ (SO ₄) ₃ , so the valency of aluminium atom is, while the valency of sulphate group is				
9 - The valency of sodium in sodium carbonate Na ₂ CO ₃ isand its valency in sodium chloride NaCl is				
6 - Give reason for each of the following :				
6 - The chemical formula of calcium phosphate is, and it consists of atoms ofdifferent elements 7 - In the chemical formula X ₂ Y ₃ the number (3) represents theof Y 8 - If the formula of aluminium sulphate is Al ₂ (SO ₄) ₃ , so the valency of aluminium atom is, while the valency of sulphate group is				

2 - An oxygen atom joins two atoms of sodium when composing one molecule of	f sodium oxide?
7 - Put ($$) or (x) then correct the false statement :	
1 – The chemical formula indicates the type and the number of atoms in a molecule	()
2 – The chemical formula of calcium carbonate is CaCO ₃	()
3 – The chemical formula of aluminium sulphate is $Al_3(SO_4)_2$	()
4 – The chemical formula of silver nitrates is AgNO ₃	()
5 - Both lithium bicarbonate and sodium carbonate have the same number of atoms(()
6 – The molecule of sodium sulphate consists of three different elements ((
7 - Water molecule consists of four atoms of two different elements	()
8 – The valency of sodium in NaCl is monovalent, while it is divalent in Na ₂ CO ₃ (.	
9 – In the compound (XY ₂), (Y) is a divalent and (X) is monovalent)
8 - Choose the correct answer:	
1 – The chemical formula indicates thein the compound	
a. number of atoms b. type of atoms	c. number of element d. all the previous
2 - Element (M) form a compound M(OH) ₃ , so its valency is	
a. monovalent b. divalent	c. trivalent d. tetravalent
3 - In the compound X(NO ₃) ₂ , the valency of element (X) is	
a. monovalent b. divalent	c. trivalent d. tetravalent

Fourth: Chemical Compounds

I – Write the definition of each	of the following :		
2 - Bases (Alkalis) :			
2 - Compare between each of	the following :		
1 - Acids and Bases (Alkalis)			
P.O.C	Acids	Bases	
Its taste			
The effect of litmus paper			
Examples			
2 - Metal oxides and Nonmetal oxides			
P.O.C	Metal oxides	Nonmetal oxides	
Definition			
Examples			

3	_	Sol	ubl	e	salts	and	inso	ubl	e sa	lts
_				_	JULI	CLAR CL			-	

P.O.C	Soluble salts	Insoluble salts
Examples		

3 - Write the scientific term for each of the following :

- 1 Substances dissociate in water producing positive hydrogen ions (H⁺)
- 2 Compounds have a sour taste and turns litmus paper into red
- **3 Substance** dissociate in **water** producing **negative hydroxide ions** (OH⁻)
- 4 Compounds have a bitter taste and turn litmus paper into blue
- 5 Compounds that are resulted from the combination between oxygen and an element even though it is a metal or non-metal
- 6 Oxides produced due to the combination of oxygen with a metal
- 7 Oxides produced due to the combination of oxygen with a nonmetal
- 8 **Compounds** that are found within the **components** of the **Earth's crust** or dissolved in **water** of **seas** and **oceans**
- 9 Compounds that resulted from the combination of a positive metal ion (or a positive atomic group) with a negative atomic group (or a negative nonmetal ion except oxygen ion)

4 - Mention an example for each of the following:

1 – An acid contains oxygen	()	6 - A metal oxide	()
2 – An acid doesn't contain oxygen	()	7 – A nonmetal oxide	()
3 - A compound turns the blue litmus paper into red	()	8 – Water soluble salt	()
4 – A base (an alkali)	()	9 – Water insoluble salt	()
5 - A compound turns the red litmus paper into blue	()		

- Write the - chemical formula - for these compounds :							
ı. Table salt (.)	6. Lead io	odide ()				
2. Sodium sulphide ()	7. Lead s	ulphate ()				
3. Potassium sulphate ()	8. Sodium	n carbonate ()				
4. Calcium nitrate (.)	9. Potass	ium carbonate ()				
5. Silver chloride	()	10. Ammo	nium carbonate ()				
b – Identify (mention) the	: - type - of the following	ng compounds:	75				
1. КОН	()	7. HBr	()				
2. NaCl	()	8. Ca(OH	I) ₂ ()				
3. MgO	()	9. HNO ₃	()				
4. H ₂ SO ₄	()	10. PbSO ₄	()				
5. CO ₂	()	11. Al ₂ O ₃	()				
6. NH ₄ Cl	()	12. CuSO ₄	()				
– Complete the following table :							
	_			_			
The compound	Its name	Number of elements	Number of atoms	Its type			
CO ₂	2		••••••				
NaNO ₃							

......

......

.....

......

......

.....

 $Al_2(SO_4)_3$

......

......

Limewater

CaCO ₃		 	
	Lithium bicarbonate	 •••••	
CaO		 	
	Caustic soda	 	
	Sulphuric acid	 	

8 - Complete the following statements :

1 - Compounds are classified according to their properties into, bases, and and
2 - On dissolving in water, acids give positiveions and alkali give negativeions
3 - We can useto distinguish between acids and bases
4 - Acids havetaste and change the colour of litmus paper into, while bases havetaste and change the colour of litmus paper into
5 - The symbol of all mineral acids begin with atom , while the symbol of all bases end with group
6andare examples of acids , whileare examples of bases
7 - The chemical formula of hydrochloric acid is but the chemical formula of sodium hydroxide is
8- The symbol of caustic soda is, while that of limewater isand both of them are considered as
9 - H ₂ SO ₄ is, while NaOH is
10 - The chemical formula of water is, but that of sulphuric acid is
11is from acids that contain oxygen, whiledoesn't contain oxygen
12is an example of metal oxides, whileis an example of nonmetal oxides
13 - The valency of copper in Cu₂O is, while in CuO is
14 - Salts exist within the components of theor dissolved in water of and
15 - Salts are produced as a result of combination of a positive metal ion with negativeor negativeexceptexception
16 - All of negative ions formexcept, negativeion

17 - Salts are variant in some of their properties such as, s	mell andin water					
18 – Sodium sulphate is from salts thatin water , while lead sulphate is from the salts thatin water						
19 - All of carbonate saltsdissolve in water except, sodium of	9 - All of carbonate saltsdissolve in water except, sodium carbonate,andand					
9 - Give reason for each of the following :						
1 - All acids turn the colour of litmus to be red and having a sour taste, while	all bases turn the colour of litmus to be blue ?					
2 – Acids have effect on litmus paper which is different from bases ?						
3 - Aluminium oxide is a metal oxide, while sulphur trioxide is a nonmet	al oxide?					
4 - We can obtain sodium chloride solution not silver chloride solution?						
5 - Caustic soda is from bases, while lead bromide is from salts?						
10 - Put ($$) or (x) then correct the false statement :						
1 - Compounds are divided according to their properties and electronic structu	re into acids, bases oxides and salts ()					
2 - Oxides are substances that dissociate in water producing positive hydrogen	ion ()					
3 - Salts are substances that dissociate in water producing negative hydroxide	ions (OH) ⁻ ()					
4 - Mineral acids are formed when hydrogen joined with a negative atomic gro	oup except nitrate group ()					
5 - Acids turn red litmus paper into blue, while bases turn it into red	()					
6 - The chemical formula of calcium hydroxide is CaOH	()					
7 - H ₂ SO ₄ and NaOH are considered acids	()					
8 - Caustic soda and limewater are considered alkali	()					
9 – Sodium hydroxide changes the colour of litmus paper into red	()					

10 – Sulphur trioxide (SO ₃) is from metal ox	kides	()		
11 - SO ₂ is the symbol of sodium oxide		()		
12 – Sodium chloride is considered a base (a	an alkali)	()		
13 - Sodium chloride is a water soluble salt,	, while silver chloride in insoluble sal	t ()		
14 – Sodium carbonate, potassium carbona	te and ammonium carbon are soluble	e in water ()		
II - Choose the correct answer :	:			
1 – When an acid dissolves in water , it pro	ducesions			
a. (OH)+	b. H ⁻	c. H ⁺	d. (OH)-	
2 - Mona bought a cup of yogurt and foun	d the taste is sour , so she concluded	that it contains a compound from		
a. acids	b. bases	c. salts	d. oxides	
3 - Combination of hydrogen with a nega	tive atomic group produces			
a. an acid	b. an oxide	c. a base	d. a salt	
4 - The chemical formula of sulphuric a	cid is			
a. H2O	b. HCl	c. H ₂ SO ₄	d. HNO ₃	
5 - All of these substances turn litmus pape	er into red, except			
a. HCl	b. HNO ₃	c. NaOH	d. H2SO4	
6 - Acids can contain any of the following	negative atomic groups, except	9		
a. ammonium group	b. hydroxide group	c. carbonate group	d. sulphate group	
7 - When an alkali (base) dissolves in wat	er, it givesions			
a. (OH)+	b. H ⁻	c. (OH) ⁻²	d. (OH)-	

8 – The chemical formula of sodium hyd	roxide is		
a. NaOH	b. NaCO ₃	c. NaHCO ₃	d. $Na_2(CO_3)_2$
9 – All of these substances turn litmus pape	r into blue , except		
a. NaOH	ь. кон	c. Ca(OH) ₂	d. HBr
10 – All of the aqueous solutions of the follo	wing compounds have bitter taste, excep	pt	
a. sodium hydroxide	b. sulphuric acid	c. calcium hydroxide	d. potassium hydroxide
11 - Caustic soda is one of the			
a. oxides	b. salts	c. acids	d. alkalis
12 – What is the chemical name of caustic	soda?		
a. Magnesium hydroxide Mg(OH) ₂		c. Sodium hydroxide NaOH	
b. Calcium hydroxide Ca(OH) ₂		d. Potassium hydroxide KOH	
13- What is the chemical name of limewa	ter?		
a. Magnesium hydroxide Mg(OH) ₂		c. Sodium hydroxide NaOH	
b. Calcium hydroxide Ca(OH) ₂		d. Potassium hydroxide KOH	
14 - The molecules of sodium hydroxide,	water and sulphuric acid share in the p	oresence (existence) ofof eac	ch of them
a. hydrogen and nitrogen		c. oxygen and sodium	
b. hydrogen and oxygen		d. hydrogen and sodium	
15 - All of these are nonmetal oxides , exce	ept		
a. CO ₂	b. P ₂ O ₅	c. SO ₃	d. Al ₂ O ₃
16 – Which of the following formulae are co	rrect for copper oxides?		
a. CuO and CuO2		c. CuO and CuO ₃	
b. Cu₂O and CuO		d. Cu2O ₃ and Cu2O	

17 – Sodium chloride is	······						
a. an acid	b. an oxide	c. a base	d. a salt				
18 - Which of the following ions combine together to form a salt ?							
 a. negative chloride ion with positive hydrogen ion b. negative sulphate group with positive atomic group c. negative hydroxide group with positive sodium ion d. negative hydroxide group with positive hydrogen ion 							
19 - The salt that is formed from the com	bination of a positive metal ion with a ne	gative atomic group is					
a. NaCl	b. (NH ₄) ₂ SO ₄	c. NaBr	d. Na ₂ CO ₃				
20 - The salt that is formed from the com	bination of a positive atomic group with	a negative atomic group is					
a. NH ₄ Cl b. (NH ₄)₂CO ₃		c. Na₂SO₄ d. NH₄Br					
21 – Ammonium chloride salt is formed	on the combination (union) of						
a. a positive metal ion with negative at	romic groups	c a negative nonmetal ion with a posit	c. a negative nonmetal ion with a positive atomic group d. a negative nonmetal ion with a negative nonmetal ion				
b. a positive metal ion with negative no							
	onmetal ion						
b. a positive metal ion with negative no	onmetal ion						
b. a positive metal ion with negative no	ch (CO ₃ -2) group,is formed b. a base	d. a negative nonmetal ion with a negat	tive nonmetal ion				
b. a positive metal ion with negative not combination of (Mg ⁺²) ion with a. an acid	ch (CO ₃ -2) group,is formed b. a base	d. a negative nonmetal ion with a negat	tive nonmetal ion				
 b. a positive metal ion with negative not 22 – On the combination of (Mg⁺²) ion wit a. an acid 23 – All the following substances affect the 	ch (CO ₃ -2) group,is formed b. a base e colour of litmus paper , except b. NaOH	d. a negative nonmetal ion with a negative c. an oxide	d. a salt				
 b. a positive metal ion with negative not 22 – On the combination of (Mg⁺²) ion with a. an acid 23 – All the following substances affect the a. HCl 	ch (CO ₃ -2) group,is formed b. a base e colour of litmus paper , except b. NaOH	d. a negative nonmetal ion with a negative c. an oxide	d. a salt				
 b. a positive metal ion with negative not 22 - On the combination of (Mg⁺²) ion with a. an acid 23 - All the following substances affect the a. HCl 24 - From soluble (dissolved) salts in water 	ch (CO ₃ -2) group,is formed b. a base e colour of litmus paper, except b. NaOH ater is b. AgNO ₃	d. a negative nonmetal ion with a negative c. an oxide c. NaCl c. PbI ₂	d. a salt d. H₂SO₄				

26 - All of negative ions form salts , except ion							
a. oxygen	b. nitrogen	c. chlorine	d. bromine				
12 - Choose the odd word - wi	12 – Choose the odd word – write the scientific term :						
1 – NaOH – Ca(OH) ₂ – KOH – HCl	() ()					
$_{2}$ - $Al_{2}O_{3}$ - SO_{3} - SO_{2} - CO_{2}	() ()					
$3 - NaCl - K_2SO_4 - AgCl - Na_2S$	() ()					
13 – Answer the following ques	tions :						
1 - Choose the suitable diagram for ea	ch of the following :						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $							
a. A divalent metallic element	A B	d. A monovalent nonmetallic element					
b. A divalent nonmetallic element	()	e. A monovalent metallic element	()				
c. A nobel gas	()	c. 77 monovarent metanic ciement	(
2 - If you have an element 19 ³⁹ X							
a. Mention its kind? Why?							
-	d. Complete: it combines with sulphate group to givesalt						
3 - From the following formula (H, K,							
a. A chemical formula for an acidb. A chemical formula for a basec. A chemical formula for a salt							

4 - Two elements (X) and (Y), their atomic numbers are 11 and 17 respectively. answer the following questions:		
a. Write the electronic distribution of each one :		
b. What is the valency of each one? (Give reason):		
c. What is the type of each element?		
d. What is the type of the bond resulted from their combination?		
e. What is the type of the compound resulted from their combination?		
5 - A compound has a chemical formula ZCl ₂ , where the electrons of the element (Z) are distributed in 3 energy level	els.Deduce the followi	ng:
1. The <i>type</i> of <i>element</i> (Z) and why?		
2. The <i>type</i> of its <i>ion</i> and why?		
3. The <i>number</i> of <i>electrons</i> and <i>protons</i> of its <i>ion</i> ?		
6- From the opposite figure, when the element (X) combines with element (Y), this produces compound its		
chemical formula is		00
a. XY	((0)) ($\{ \bigcirc \} \}$
b. XY ₂		
c. X_2Y		00
d. X ₆ Y	Atom of	Atom of
7 - Study the opposite diagram, then answer:	element (X)	element (Y)
a. Write the names of element (A) and (B)		
b. Mention the <i>valency</i> of the two element? (G.R)	$\sim 1/1$	α
c. Write the name and the chemical formula of the compound which is produced from the combination between	$\begin{pmatrix} 13P \\ 14P \end{pmatrix}$	$\binom{8P}{8n}$
element (A) and element (B)	(41)	
	2 8 3	2 6
		FI (D)
	Element (A)	Element (B)